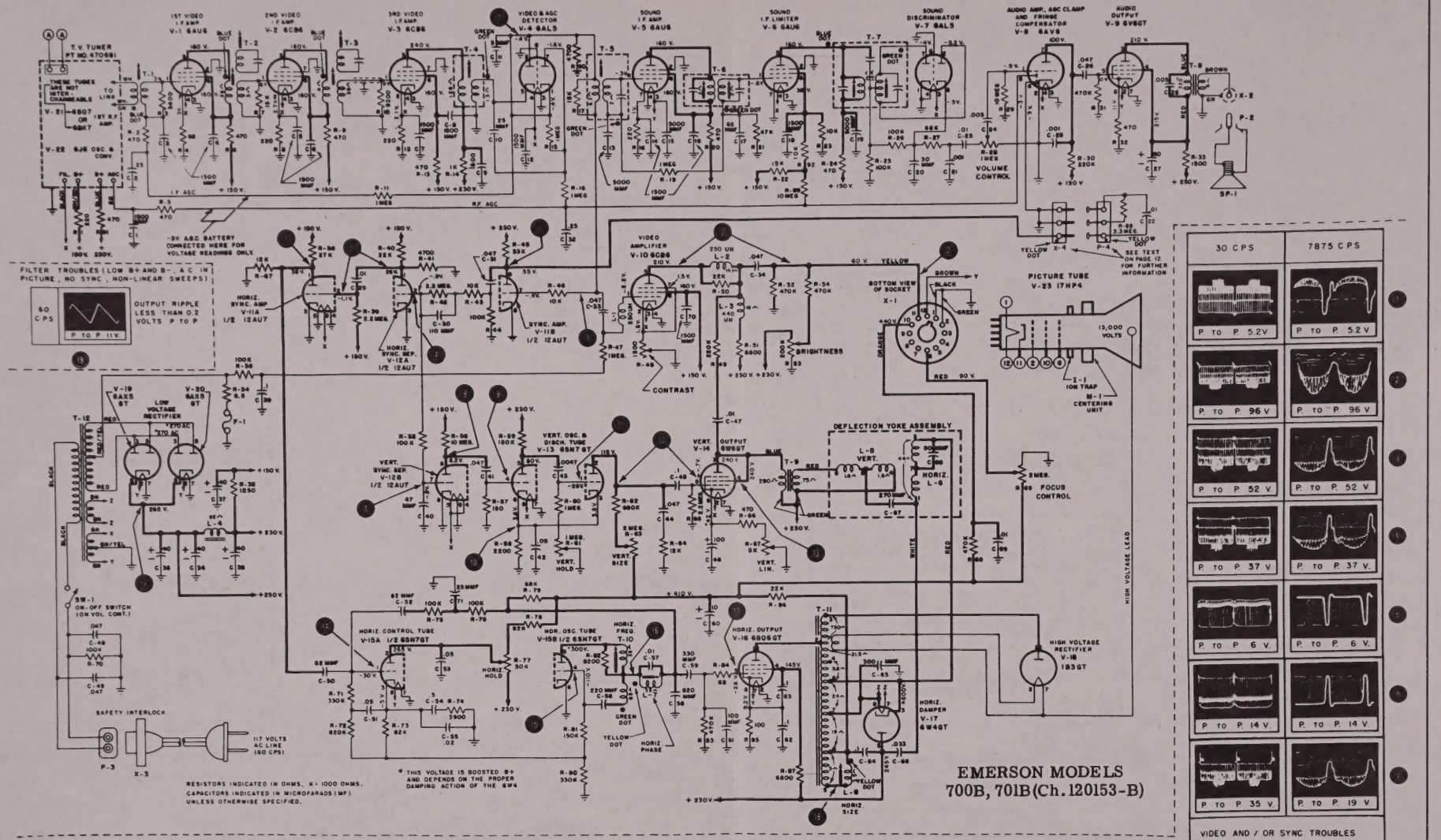
The Cooperation of the Manufacturer of This Receiver Makes It Possible to Bring You This Service.


1ST VIDEO I.F. AMP. V-1 6AU6
2ND VIDEO I.F. AMP. V-2 6CB6
3RD VIDEO I.F. AMP. V-3 6CB6
VIDEO & AGC DETECTOR V-4 6AL5
SOUND 1ST I.F. AMP. V-5 6AU8
SOUND I.F. LIMITER V-6 6AU8
SOUND DISCRIMINATOR V-7 6AL5
AUDIO AMP., AGC CLAMP AND FRINGE COMPENSATOR V-8 6AV8
AUDIO OUTPUT V-9 6V6GT
T.V. TUNER PT NO. 470691
VOLUME CONTROL
SP-1
P-2
I.F. AGC
R.F. AGC
-3V. A&C BATTERY CONNECTED HERE FOR VOLTAGE READINGS ONLY
FILTER TROUBLES (LOW B+ AND B-, A.C. IN PICTURE, NO SYNC., NON-LINEAR SWEEPS)
60 C.P.S.
OUTPUT RIPPLE LESS THAN 0.2 VOLTS P TO P
HORIZ. SYNC. AMP. V-11A 1/2 12AU7
SYNC. AMP. V-11B 1/2 12AU7
HORIZ. SYNC. REP. V-12A 1/2 12AU7
VERT. SYNC. REP. V-12B 1/2 12AU7
VIDEO AMPLIFIER V-10 6CB6
CONTRAST
BRIGHTNESS
PICTURE TUBE V-23 17HP4
BOTTOM VIEW OF SOCKET X-1
13,000 VOLTS
I-1 ION TRAP
M-1 CENTERING UNIT
DEFLECTION YOKE ASSEMBLY
FOCUS CONTROL
LOW VOLTAGE RECTIFIER V-19 6AX5 GT
V-20 6AX5 GT
SW-1 ON-OFF SWITCH (ON VOL. CONT.)
SAFETY INTERLOCK
117 VOLTS A.C. LINE (60 CPS)
P-3
X-3
VERT. OSC. & DISCH. TUBE V-13 6SN7GT
VERT. OUTPUT V-14 6V6GT
VERT. SIZE
VERT. HOLD
VERT. LIN.
HORIZ. CONTROL TUBE V-15A 1/2 6SN7GT
HOR. OSC. TUBE V-15B 1/2 6SN7GT
HORIZ. FREQ. T-10
HORIZ. HOLD
HORIZ. PHASE
HORIZ. OUTPUT V-16 6BQ6GT
HORIZ. DAMPER V-17 6W4GT
HORIZ. SIZE
HIGH VOLTAGE RECTIFIER V-18 1B3GT
HIGH VOLTAGE LEAD
RESISTORS INDICATED IN OHMS, K = 1000 OHMS.
CAPACITORS INDICATED IN MICROFARADS (MF) UNLESS OTHERWISE SPECIFIED.
* THIS VOLTAGE IS BOOSTED B+ AND DEPENDS ON THE PROPER DAMPING ACTION OF THE 6W4

EMERSON MODELS 700B, 701B (Ch. 120153-B)

	30 CPS	7875 CPS
1	P TO P 5.2 V	P TO P 5.2 V
2	P TO P 96 V	P TO P 96 V
3	P TO P 52 V	P TO P 52 V
4	P TO P 37 V	P TO P 37 V
5	P TO P 6 V	P TO P 6 V
6	P TO P 14 V	P TO P 14 V
7	P TO P 35 V	P TO P 19 V

VIDEO AND / OR SYNC TROUBLES (LACK OF CONTRAST, TEAR, OVERLOAD, NO HORIZONTAL OR VERTICAL HOLD, POOR HOLD, JITTER, ETC.)

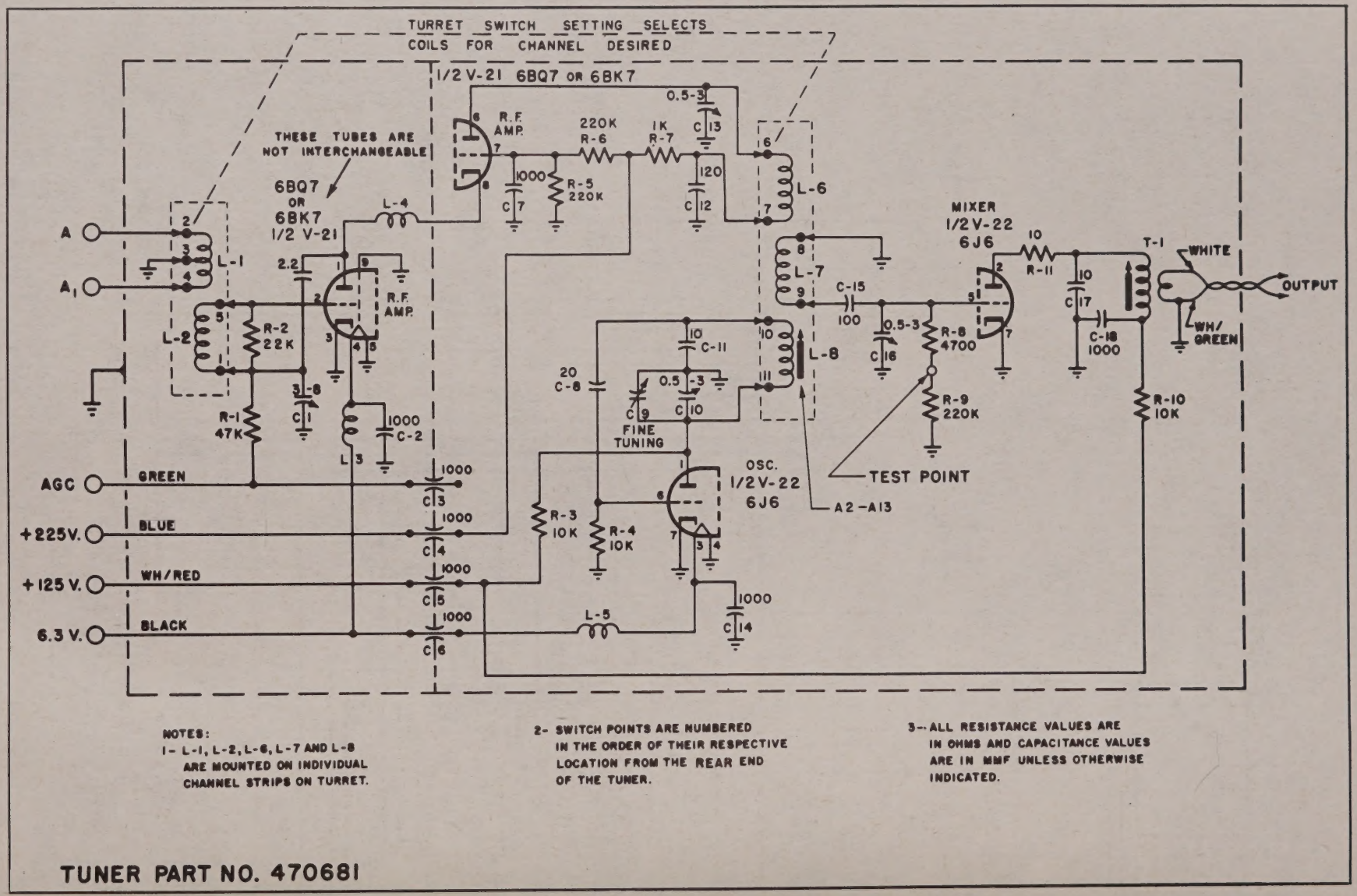
HORIZONTAL TROUBLES (POOR HOLD, TEAR, NO HORIZONTAL HOLD, NO HIGH VOLTAGE, POOR HORIZONTAL LINEARITY)

	7875 CPS					
	P TO P 280 V	P TO P 96 V	P TO P 125 V	P TO P 300 V	P TO P 30 V	
	18	17	16	15	14	

VERTICAL TROUBLES (NO VERTICAL HOLD, NO VERTICAL SIZE, POOR VERTICAL HOLD, VERTICAL JITTER, POOR VERTICAL LINEARITY)

	30 CPS					
	P TO P 365 V	P TO P 70 V	P TO P 70 V	P TO P 9 V	P TO P .3 V	P TO P 2 V
	13	12	11	10	9	8

* FOR THIS MEASUREMENT READJUST VERTICAL HOLD TO STOP PICTURE ROLL.
† HORIZ. GAIN ON SCOPE FULLY OPEN.
P TO P = PEAK TO PEAK



NOTES:

1- L-1, L-2, L-6, L-7 AND L-8 ARE MOUNTED ON INDIVIDUAL CHANNEL STRIPS ON TURRET.

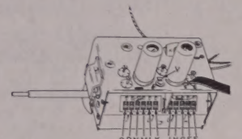
2- SWITCH POINTS ARE NUMBERED IN THE ORDER OF THEIR RESPECTIVE LOCATION FROM THE REAR END OF THE TUNER.

3--ALL RESISTANCE VALUES ARE IN OHMS AND CAPACITANCE VALUES ARE IN MMF UNLESS OTHERWISE INDICATED.

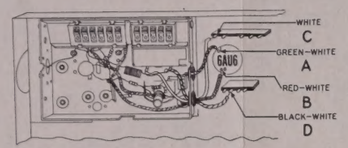
TUNER PART NO. 470681

SCHEMATIC DIAGRAM OF TURRET TYPE TUNER #470681 USED ON CHASSIS 120153-B

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE



508890 TUNER UNIT



BOTTOM VIEW OF CHASSIS SHOWING CONNECTIONS TO RF TUNER UNIT

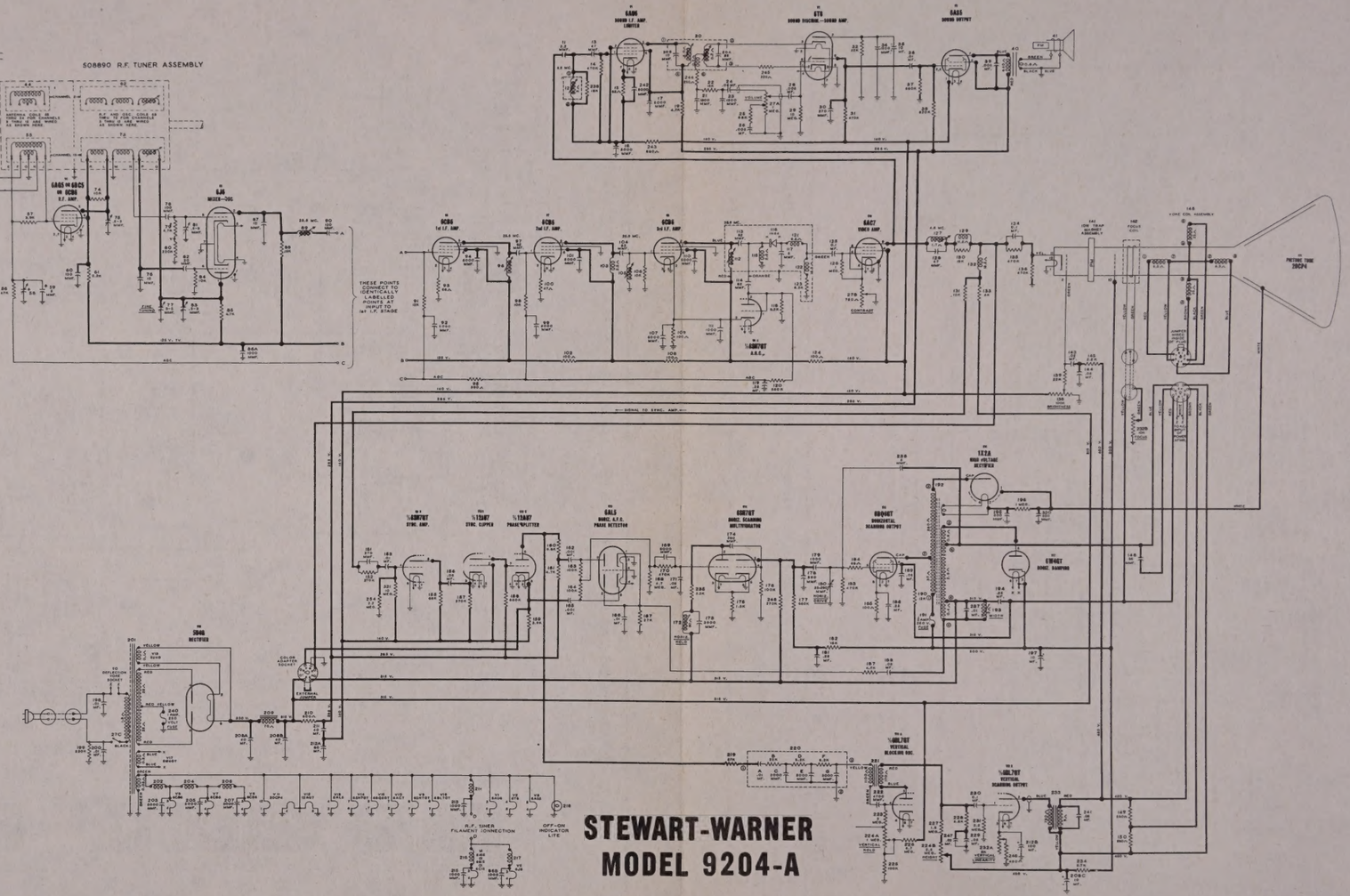
Lettered terminals in illustrations correspond to similarly lettered terminals on the circuit diagram.

PRODUCTION CHANGES

The following tabulation furnishes complete details on changes which occurred during receiver production. The receivers incorporating these changes are identified by coding stamped on rear surface of chassis. This coding consists of one or more letters following the word SERIES, as SERIES B, SERIES AC, etc., and corresponds to similarly lettered changes shown below. Chassis incorporate only that change indicated by letter designation i.e., chassis stamped "SERIES BE" does not include changes "A" or "B" or "D".

The circuit shown on this page applies to a "Series DE" chassis.

LETTER INCLUDED IN DESIGNATION FOLLOWING THE WORD "SERIES"	CHANGE INCORPORATED IN CHASSIS
UNCODED	INITIAL PRODUCTION
"A"	No chassis were produced with this series designation.
"B"	No chassis were produced with this series designation.
"C"	No chassis were produced with this series designation.
"D"	This change was incorporated so that proper centering can be obtained without introducing neck shadow. 1. Yellow lead of Focus Coil 142 was disconnected from the 340 volt B+ supply and reconnected to pin 7 of the deflection yoke socket.
"E"	This change was incorporated to improve the Vertical Hold action. 1. Resistor 321 (10 Meg.) was added from pin 4 of tube V98 (Sync. Amp.) to the 140 volt B+ supply.



PRELIMINARY DATA
The data contained in this folder is published in advance of regular PHOTOFACT Coverage

SET 157 FOLDER 1A

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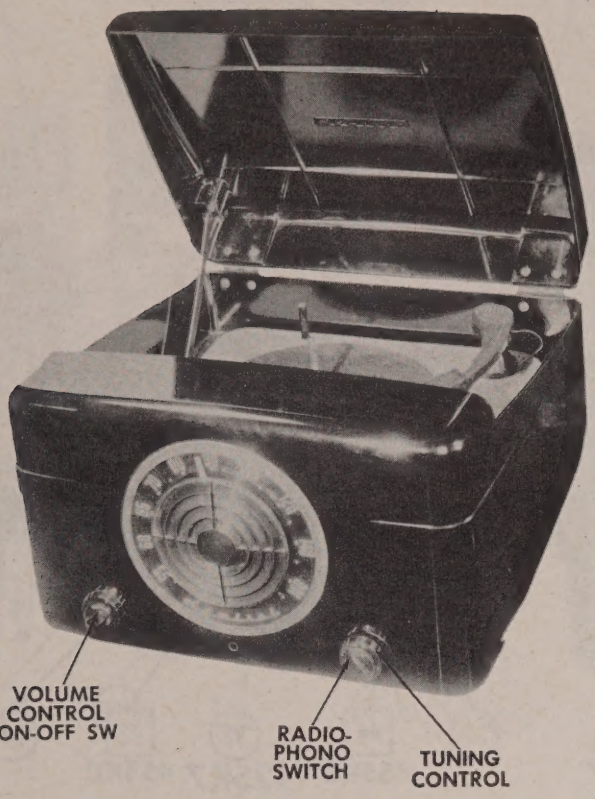
ADMIRAL
CHASSIS 5M2



ADMIRAL
CHASSIS 5M2

Admiral Model 5M21

TRADE NAME	Admiral Models 5M21, 5M22 (Ch. 5M2)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St. Chicago, 47, Ill.
TYPE SET	AC Operated Radio-Phono Combination Superheterodyne Receiver With Loop Antenna
TUBES (FIVE)	Types 12SA7, Conv., 12SK7 IF Amp., 12SQ7 Det.-AVC-AF Amp., 50L6GT Power Output. 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC
RATING	.26 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.
Use isolation transformer, if available, If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	250MMFD	High side to stator on rear section of tuning gang. Low side to B-.	455KC (400∿mod)	Tuning gang fully open.	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output.
2.	"	"	1620KC	"	"	A5	"
3.		Loop	1400KC	Tune for max. output.	"	A6	Fashion loops of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

RECORD CHANGER UNIT - ADMIRAL MODEL RC-550

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

MODEL
ADMIRAL 5M21

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12SA7	12SA7	8R	
V2	IF Amp.	12SK7	12SK7	8N	
V3	Det.-AVC.-AF Amp	12SQ7	12SQ7	8Q	
V4	Power Output	50L6GT	50L6GT	7AC	
V5	Rect.	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	30	150		PRS150/30-30		EDL332-		TVA-3444	Filter (yellow)
B	30	150	67A14-1	-30		15C		TVA-1205	Filter (red)
				PRS25/25					
C	20	150							Decoupling (blue)
D	20	25							Power Output Cathode (green)
C2	50		65B6-4	SI50	D6-500		GP1K-500		Osc. Grid Cap.
C3	.05	400	64B1-22	P488-05	DF-503	PTE4S5		4TM-S5	Isolation Cap. *
C4	.1	200	64B1-30	P288-1	DF-104	PTE4P1		2TM-P1	AVC Filter
C5A	100		♦63A3-1	SI100	♦PC-50	5W5T1	GP1K-101	♦100C1	Diode RF Filter
B	100			SI100		5W5T1	GP1K-101		Diode RF Filter
C6	250	500	65B6-5	1468-00025	D6-250	5W5T25	GP2K-251	1FH-325	Tone Comp.
C7	.01	400	64B1-25	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C8	500		65B6-6	SI500	D6-501	5W5T5	GP2K-501	5GA-T5	AF Amp. Plate
C9	.1	200	64B1-30	P288-1	DF-104	PTE4P1		2TM-P1	RF Bypass
C10	.01	400	64B1-25	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C11	.03	400	64B1-23	P488-03		PTE6S3		6TM-S3	Power Output Plate
C12	.05	400	64B1-22	P488-05	DF-503	PTE4S5		4TM-S5	Line Filter
C13	.18	200	64A2-2						Line Isolation
C14	.1	200	64B1-30	P288-1	DF-104	PTE4P1		2TM-P1	Phono Isolation

* Used in sets with model number ending in "UL".
♦ Items C5A, C5B, and R4 are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ADMIRAL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1Meg	½	75B1-41	Q13-137	AG-63-Z	BSK-70-S	Volume Control
B	Shaft			Not Req.	KSS-3	Not Req.	Attach to R1A per instructions.
C	Switch			76-1	SWB	Not Req.	Attach to R1A per instructions.

RESISTORS

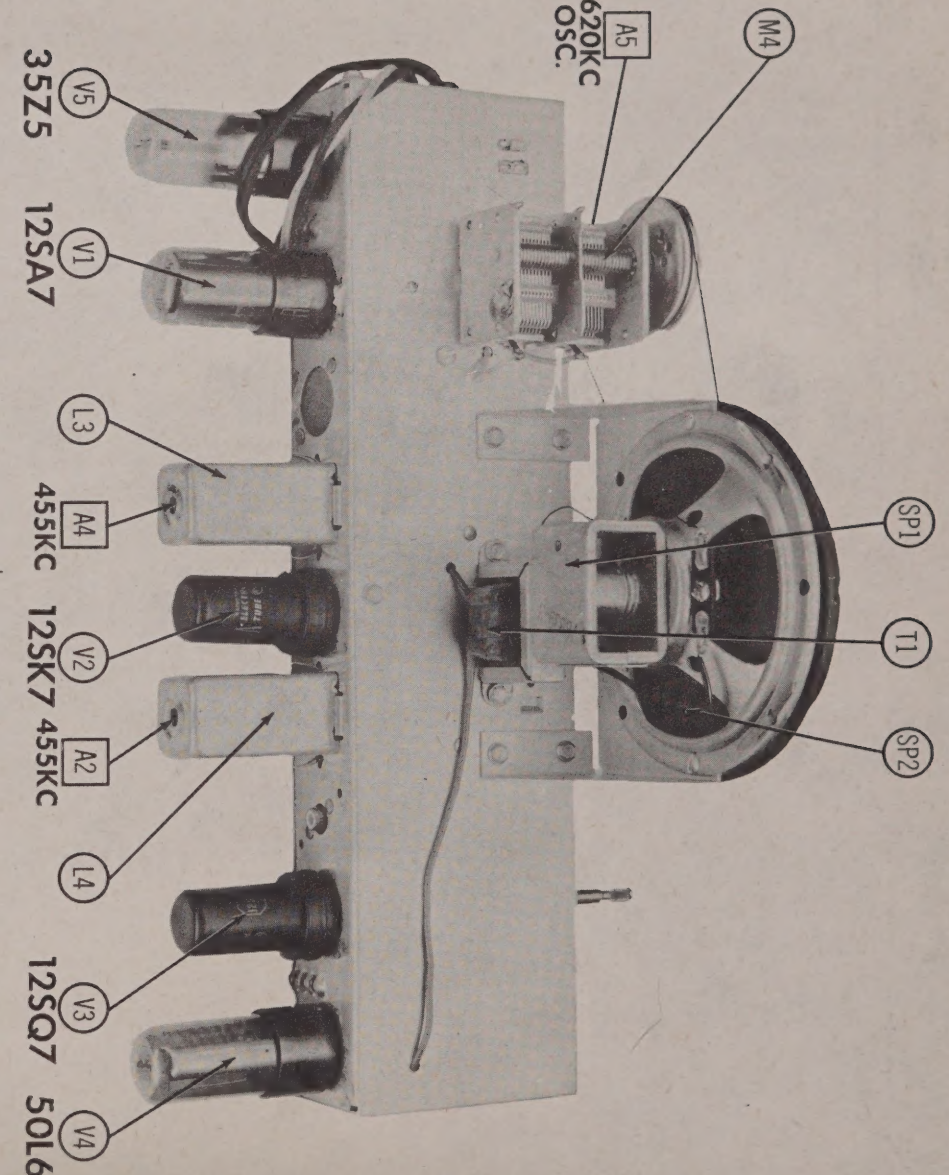
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ADMIRAL PART No.	IRC PART No.	IDENTIFICATION CODES
R2	22KΩ	½	60B8-223	BTS-22K	Osc. Grid
R3	1Meg	½	60B8-105	BTS-1Meg	AVC Network
R4	47KΩ	½	*63A3-1	BTS-47K	Diode Filter
R5	4.7Meg	½	60B8-475	BTS-4.7Meg	AF Amp. Grid
R6	470KΩ	½	60B8-474	BTS-470K	AF Amp. Plate
R7	47KΩ	½	60B8-473	BTS-47K	AF Amp. Plate Decoupling
R8	470KΩ	½	60B8-474	BTS-470K	Output Grid
R9	150Ω	1	60B14-151	BTA-150	Output Cathode
R10	1000Ω	1	60B28-2	BTA-1000	Filter
R11	220Ω	1	60B28-7	BTA-220	Filter
R12	33Ω	1	60B28-3		Surge Limiter
R13	150KΩ	½	60B8-154	BTS-150K	Isolation

* Items R4, C5A and C5B are combined into one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: ADMIRAL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	2KΩ	3Ω	210Ω	.7Ω	79A11-3	A-3876	A-2928	RO-2 ①	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	ADMIRAL PART No.	JENSEN PART No.	QUAM PART No.	
SP1	P. M.	3Ω	78B39-3	ST-105 Mod. P5-X	5A1	
	CONE DIA.	V. C. DIA.				
SP2	4 3/4 in.	9/16 in.				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	ADMIRAL PART No.	MERIT PART No.	
L1	Loop Ant.	.2Ω		69B144		Includes A6 Trimmer (30-30MMF)
L2	Osc. Coil	5.6Ω		69A52	BC-400	Tap at .6Ω
L3	Input IF	19Ω	19Ω	72B50	BC-368	
L4	Output IF	19Ω	20Ω	72B51	BC-371	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	ADMIRAL PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	409A13	AC-AG-J	A-AG	W26B	A66U	33	0-2 or S-2	

ASTATIC, SHURE, AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

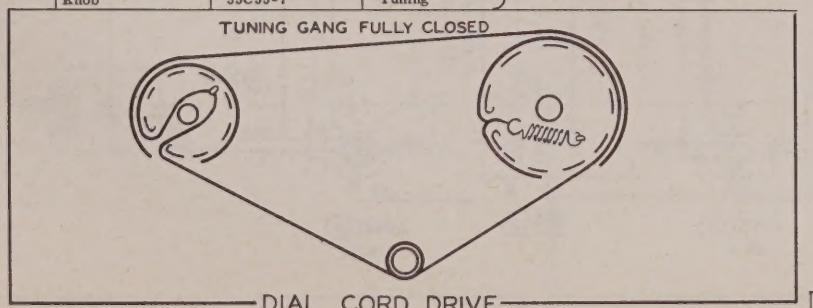
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

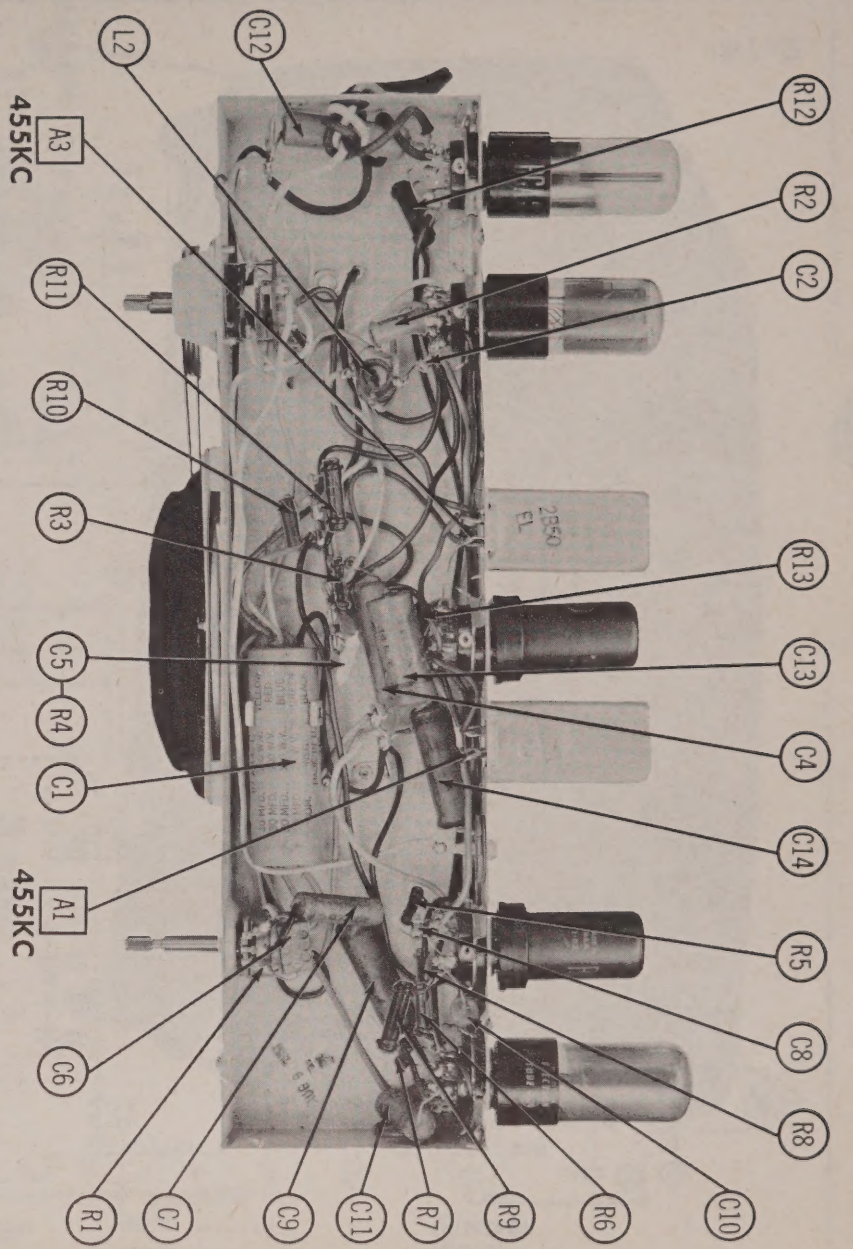
ITEM No.	REPLACEMENT DATA			REMARKS
	ADMIRAL PART No.	WALCO PART No.	JENSEN PART No.	
M2	98A15-19	W-30AGA	JP-312	

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M3	Switch	77A28-1	Radio-Phono
M4	2 Gang Var. Cap.	68B30-1	(11-343MMF, 17-157MMF)
	Cabinet Bottom	34D28-3	Ebony (Less lid)
	Cabinet Bottom	34D28-5	Mahogany (Less lid)
	Cabinet Lid	34D28-11	Ebony
	Cabinet Lid	34D28-12	Mahogany
	Dial Pointer	25A35-1	
	Knob	33C55-12	Radio Phono } Ebony (5M21)
	Knob	33C55-30	On-Off-Vol. }
	Knob	33C55-11	Tuning }
	Knob	33C55-8	Radio-Phono } Mahogany (5M22)
	Knob	33C55-31	On-Off-Vol. }
	Knob	33C55-7	Tuning }



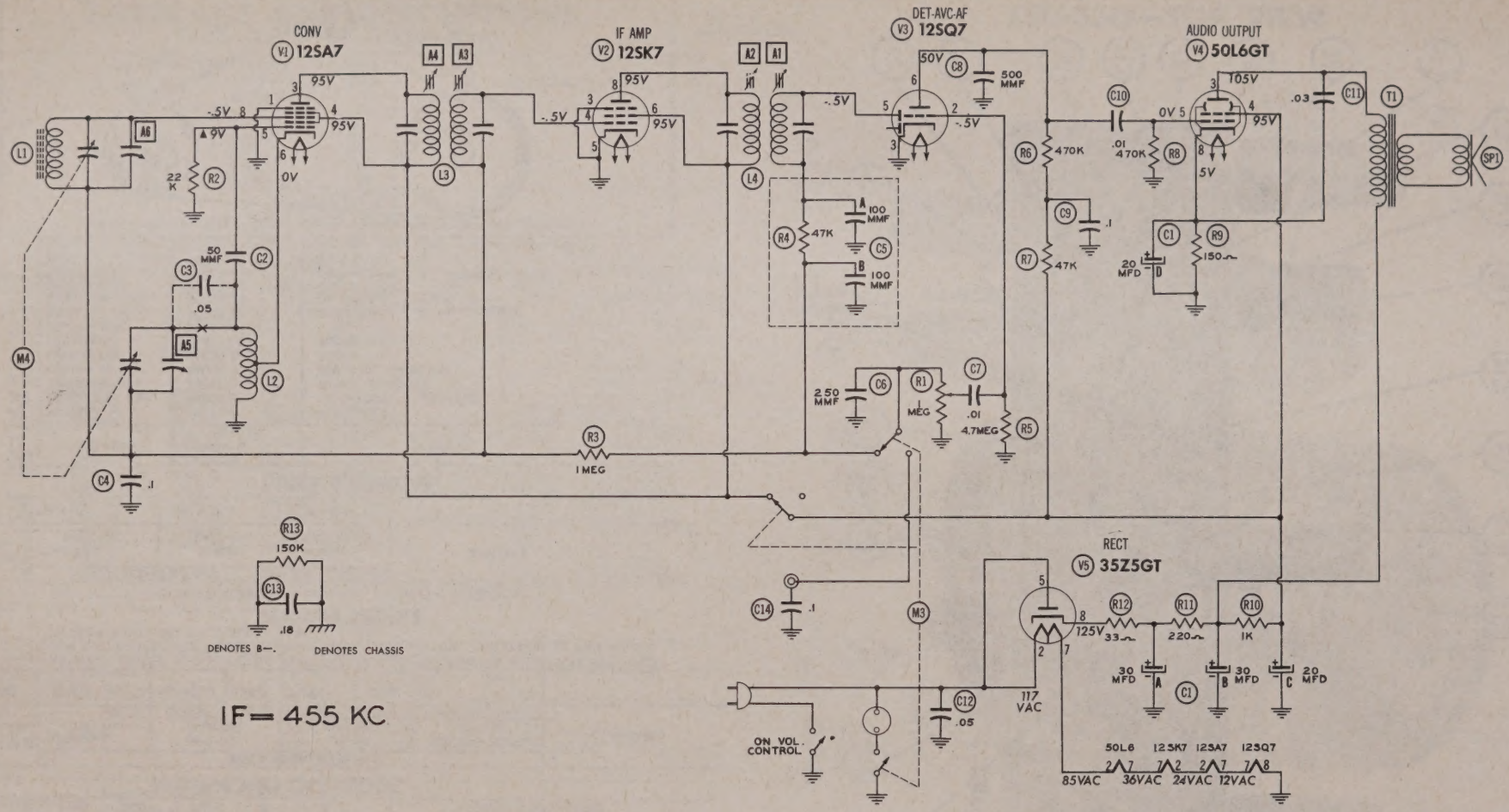
CHASSIS—BOTTOM VIEW



SET 157 FOLDER 2

MODEL ADMIRAL 5M21

MODEL ADMIRAL 5M21



IF = 455 KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	■0Ω	24Ω	†1.2KΩ	†1.2KΩ	22KΩ	.7Ω	12Ω	2Meg
V 2	12SK7	■0Ω	24Ω	0Ω	2Meg	0Ω	†1.2KΩ	36Ω	†1.2KΩ
V 3	12SQ7	■0Ω	4.7Meg	0Ω	INF	1Meg	†515KΩ	12Ω	0Ω
V 4	50L6GT	INF	86Ω	†460Ω	†1.2KΩ	470KΩ	†47KΩ	36Ω	150Ω
V 5	35Z5GT	INF	121Ω	110Ω	INF	121Ω	†33Ω	87Ω	130KΩ

▲ TAKEN WITH VACUUM TUBE VOLTMETER
ALL MEASUREMENTS TAKEN IN AM RADIO POSITION ONLY
† MEASURED FROM PIN 8 OF V5
■ MEASURED FROM CHASSIS

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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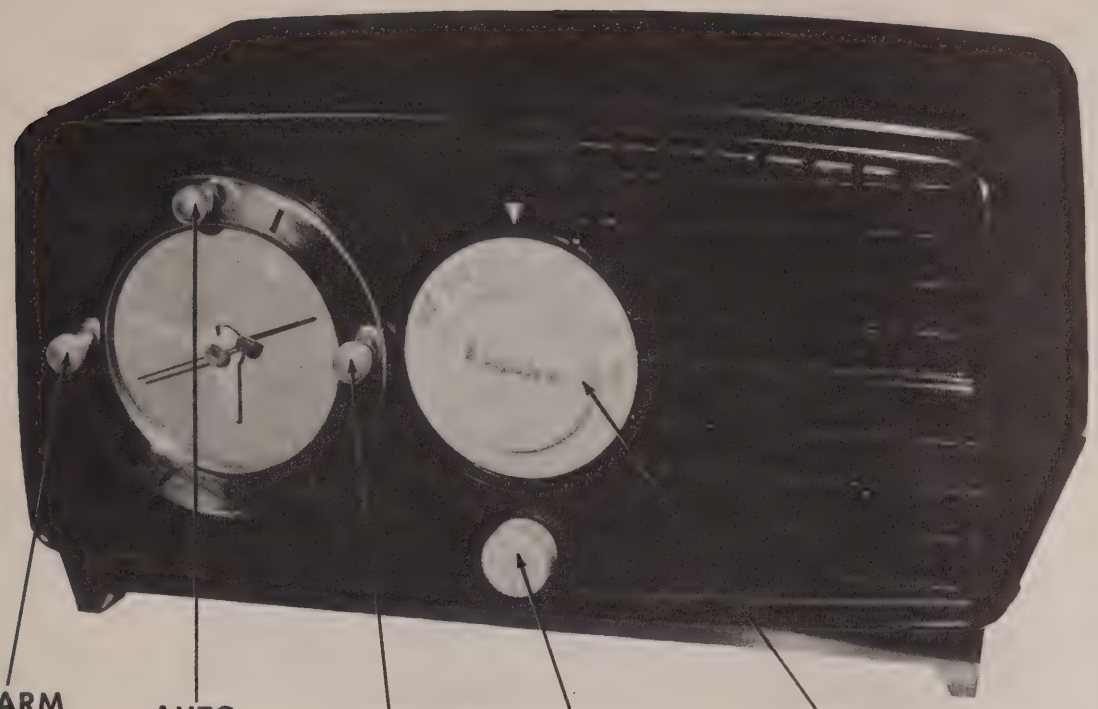
157-2

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



ESQUIRE
MODEL 511

ESQUIRE
MODEL 511

TRADE NAME	Esquire Model 511
MANUFACTURER	Esquire Radio Corp., 26 Court St., Brooklyn 2, N. Y.
TYPE SET	AC Operated Superheterodyne Receiver with Electric Clock
TUBES (FOUR)	Types 12BE6 Conv., 12AT6 Det.-AVC-AF Amp., 50C5 Power Output, 35W4 Rectifier.
POWER SUPPLY	110-120Volts AC-60 Cycle — RATING .24 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1650

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set point to last reference mark at low frequency end of dial.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to stator on rear section of tuning gang. Low side to B -.	455KC (400~Mod.)	Tuning gang fully open.	Across voice coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	100MMF	High side to ant. terminal on ant. coil. (Remove hank). Low side to B-.	1650KC	"	"	A3	Adjust for maximum output.
3.	"	"	1400KC	Tune for max. output.	"	A4	Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

ESQUIRE MODEL 511

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		ESQUIRE PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2A	Det.-AVC-AF Amp.	12AT6	12AT6	7BT	
B	Det.-AVC-AF Amp.	12AV6	12AV6	7BT	
V3	Power Output	50C5	50C5	7CV	
V4	Rect.	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	ESQUIRE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	50	150	32-2	PRS150/50-30		BRD5315A		TVA-2450	Filter (Green)
B	30	150							Filter (Red)
C2	.05	400	30-5	P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C3	100		31-1	SI100	D6-101		GP1K-101	5GA-T1	Diode RF Filter
C4	.002	200	30-12	P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Audio Coupling
C5	.01	600	30-1	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling
C6	.01	600	30-1	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Power Output Plate
C7	.05	400	30-6	P488-05	DF-503	PTE4S5		4TM-S5	Line Filter
C8	.05	400	30-5	P488-05	DF-503	PTE4S5		4TM-S5	Line Isolation

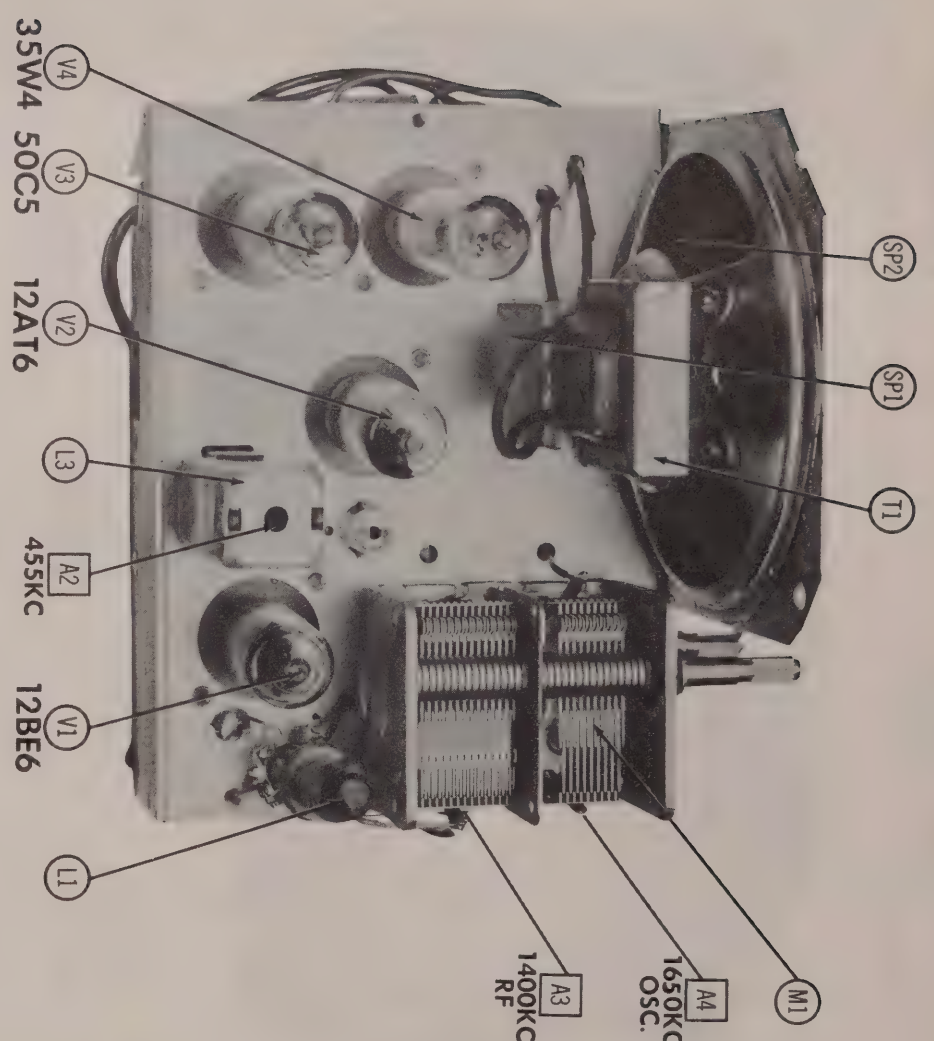
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	ESQUIRE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	2Meg	½	25-1	Q13-139	AG-66-Z	AN-76	Volume Control
B	Shaft		Not req.	Not req.	KSS-3	AK-4	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	ESQUIRE PART No.	IRC PART No.	
R2	22KΩ	½	20-5	BTS-22K	Osc. Grid
R3	4.7Meg	½	20-13	BTS-4.7Meg	AVC Network
R4	10Meg	½	20-14	BTS-10Meg	AF Amp. Grid
R5	470KΩ	½	20-9	BTS-470K	AF Amp. Plate
R6	330KΩ	½	20-8	BTS-330K	Output Grid
R7	2200Ω	1	21-4	BTA-2200	Filter
R8	22Ω	½	20-1		Rectifier Ballast
R9	22Ω	1	21-1	BW-1-22	Filament Dropping
R10	22Ω	1	21-1	BW-1-22	Filament Dropping

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		ESQUIRE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2.5KΩ	3.5Ω	175Ω	.5Ω	Part of Spkr.	A-3332 ①	A3025 ①		① Bend mounting tabs down, file out slots and mount on original bracket.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	ESQUIRE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	P.M.	3.5Ω	10-1	ST-113 Mod. P4-X	4A1	
	CONE DIA.	V. C. DIA.				
SP2	4 in.	9/16 in.				

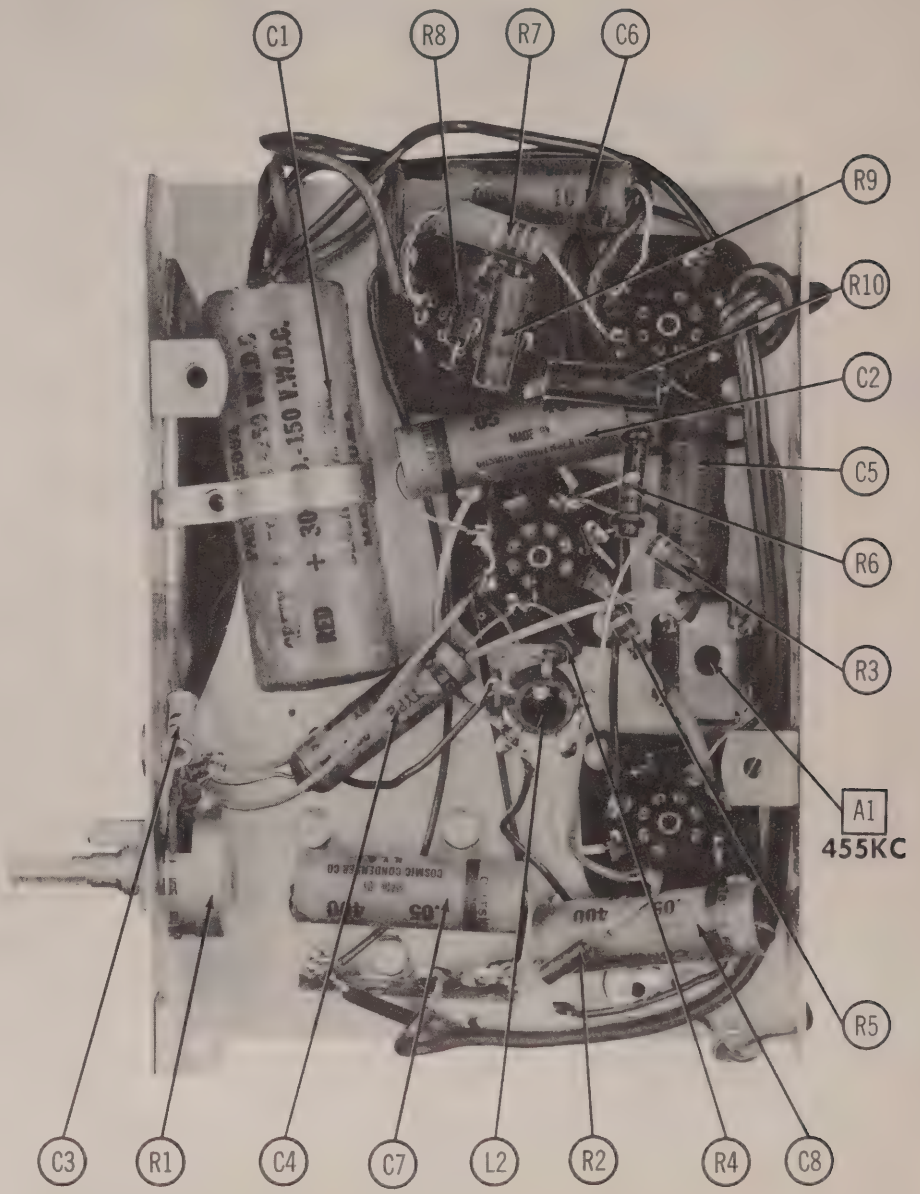
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	ESQUIRE PART No.	MERIT PART No.	
L1	Ant. Coil	68Ω	3Ω	61-2		
L2	Osc. Coil	.6Ω	5.8Ω	61-1		
L3	IF Trans.	20Ω	20Ω	62-1		

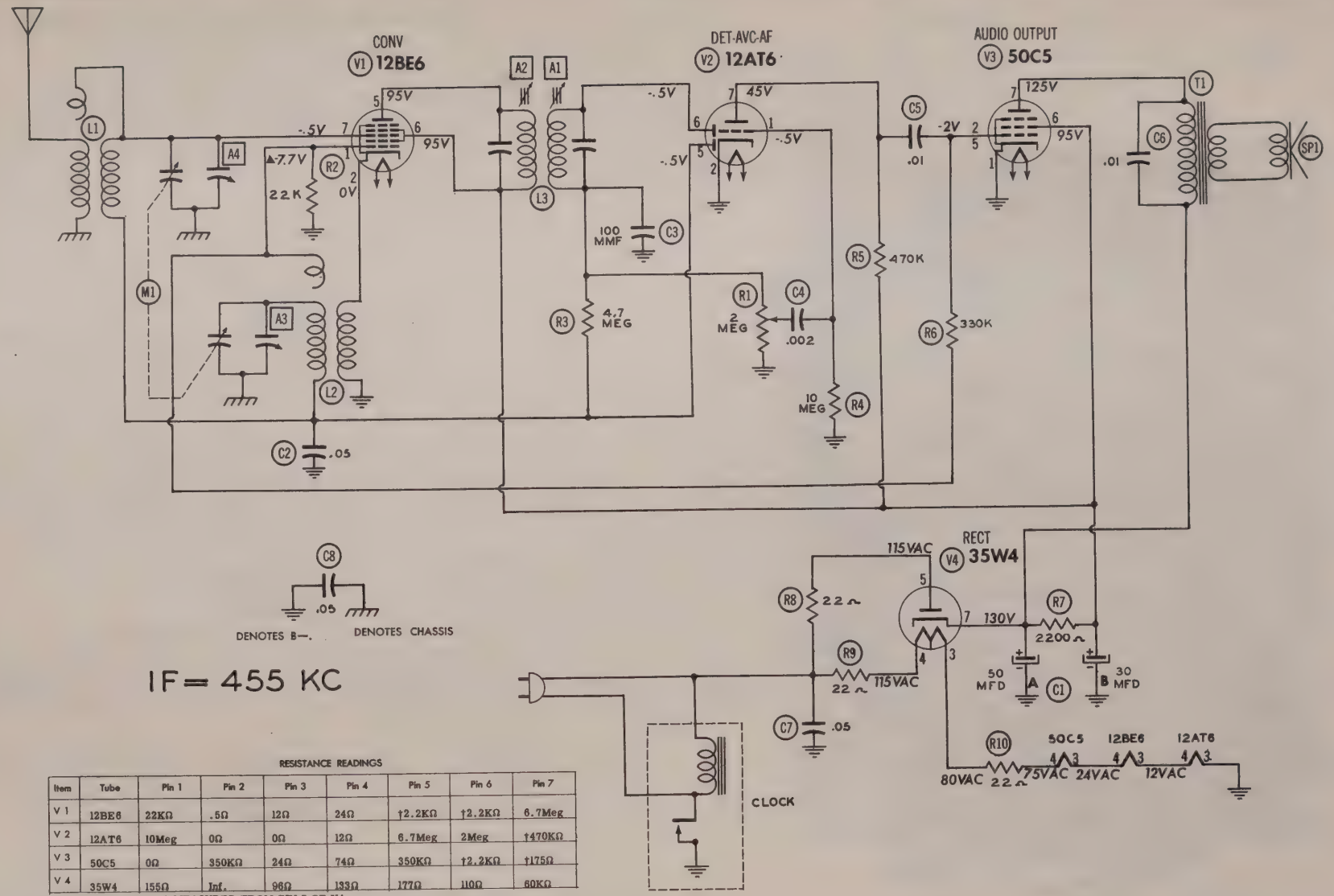
MISCELLANEOUS

ITEM No.	PART NAME	ESQUIRE PART No.	NOTES
M1	2 Gang Var. Cap.	35-1	(27-472MMF, 25-192MMF)
	Clock	13-1	
	Knob	50-4	Volume (small)
	Knob	50-3	Selector (large)

CHASSIS—BOTTOM VIEW



ESQUIRE MODEL 511



IF = 455 KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.5Ω	12Ω	24Ω	†2.2KΩ	†2.2KΩ	6.7Meg
V 2	12AT6	10Meg	0Ω	0Ω	12Ω	6.7Meg	2Meg	†470KΩ
V 3	50C5	0Ω	350KΩ	24Ω	74Ω	350KΩ	†2.2KΩ	†175Ω
V 4	35W4	155Ω	Inf.	96Ω	133Ω	177Ω	110Ω	60KΩ

† MEASURED FROM PIN 7 OF V4
▲ TAKEN WITH VACUUM TUBE VOLTMETER

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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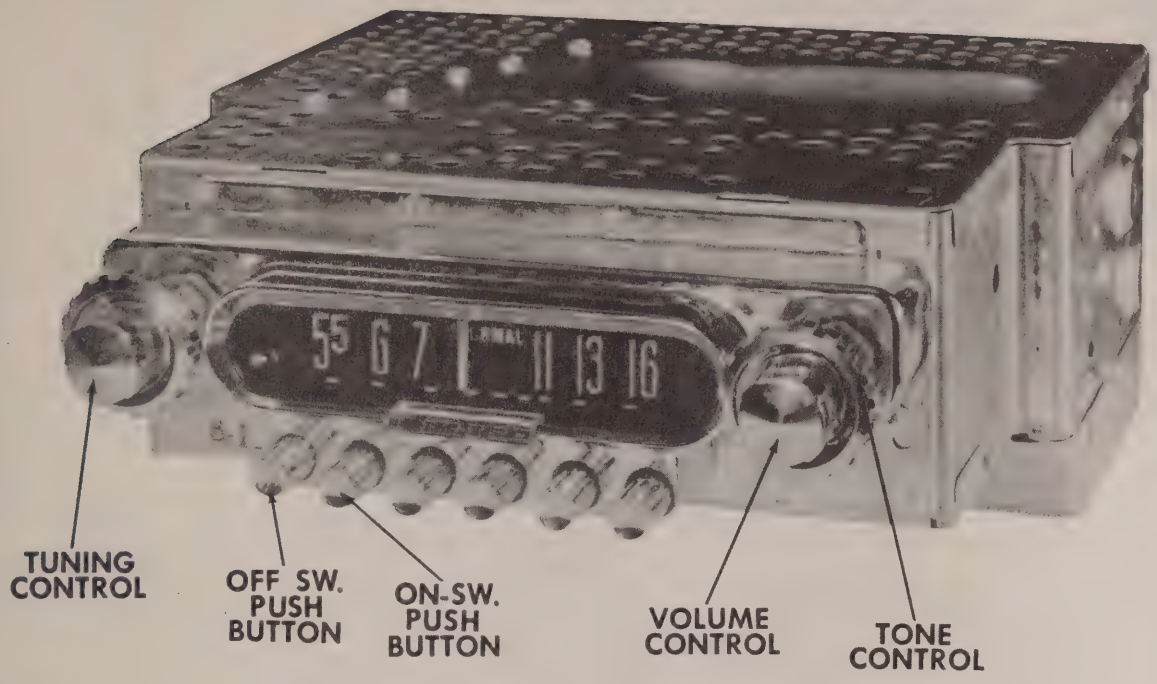
157-3

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

FORD MODELS OCF751-1 (1A-18805-D), 1CFT751-2 (1A-18805-G)



FORD MODELS OCF751-1 (1A-18805-D), 1CFT751-2 (1A-18805-G)

TRADE NAME	Ford Models OCF751-1 (A-18805-D), 1CFT751-2 (1A-18805-G)
MANUFACTURER	Sylvania Electric Prod. Inc., Radio & Tel. Div., 254 Rano St., Buffalo, New York
TYPE SET	Battery Operated Custom Built Automobile Superheterodyne Receiver
TUBES(Eight)	Types 6SK7GT RF Amp., 6SA7GT Conv., 6SK7GT IF Amp., 6SQ7GT Det-AVC-AF Amp., 6J5GT Phase Inv., (2) 6V6GT Power Output, 6X5GT Rectifier.
POWER SUPPLY	6 Volt Storage Battery RATING 8.0 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540-1625 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 8, (grid) of 6SA7, (V2). Low side to chassis.	265KC (400~Mod)	Tuning cores fully out. (High freq. end).	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1.	High side thru dummy to ant. receptacle. Low side to chassis.	1625KC	"	"	A5, A6 A7	"
	The following should be performed only after a core or coil has been replaced or tampered with.						
3.	Fig. 1	High side thru dummy to any. receptacle. Low side to chassis.	1625KC	High freq. end stop.	Across voice coil.	A5, A6	Screw cores completely out of coils. Adjust for maximum output. If necessary adjust pointer to coincide with 1610KC point on dial.
4.	"	"	1410KC	1410KC	"	A8, A9, A10	Re-lace cores to their approximately original position. (11/16 in. from end of coils). Adjust for maximum output.

In the event that the sensitivity adjustment has been tampered with, connect a voltmeter to pin 5 of V3 and chassis. Adjust R2 for 3.5 volt reading on voltmeter.
After set is installed, fully extend the antenna and tune in a weak station near 1400KC. Adjust A7 for maximum volume.

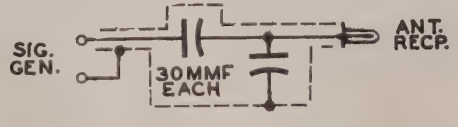


FIG. 1

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: FORD PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	45238H	6SK7GT	8N	
V2	Converter	41332H	6SA7GT	8R	
V3	IF Amp.	45238H	6SK7GT	8N	
V4	Det. AVC-AF Amp.	45239H	6SQ7GT	8Q	
V5	Phase Inverter	44547H	6J5GT	6Q	
V6	Power Output	71226H	6V6GT	7AC	
V7	Power Output	71226H	6V6GT	7AC	
V8	Rect.	71227H	6X5GT	6S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: FORD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	20	400	161-3005	AFH3-107		UP2235C		TVL-3678	■ Filter
B	20	400							▲ Filter
C	20	25							Audio Output Cathode
C2	10000		168-0002D	BPD-01	DD-103	1D3S1	821-01	5HK-S1	RF Coupling
C3	150	500	164-0150	1468-00015	D6-151	5W5T15	GP2K-151	1FM-315	AVC Filter
C4	.022	200	160-02122	P488-022	DF-203	PTE4S2		4TM-S22	AVC Filter
C5	.1	400	160-0401	P488-1	DF-104	PTE4P1		4TM-P1	RF Amp. Screen
C6	33	500	163-0033		D6-330		GP1K-330		RF Coupling
C7	10	500	164-0010	1469-00001		5R5Q1		MS-41	Fixed Trimmer
C8	230		165-0230						Fixed Trimmer
C9	.1	200	160-0201	P288-1	DF-104	PTE4P1		2TM-P1	IF Amp. Cathode
C10	.0015	400	160-04215	P688-0015	D6-152		GP2L-152	6TM-D15	Tone Comp.
C11	.0056	400	160-02256		D6-562		GP2-333-562		Tone Comp.
C12	10000		168-0002D	BPD-01	DD-103	1D3S1	821-01	5HK-S1	Audio Coupling †
C13	220	500	163-0220	1468-00025	D6-251	5W5T25	GP2K-251	1FM-325	AF Amp. Plate
C14	.022	600	160-06122	P688-022	DF-203	PTE6D2		6TM-D22	Audio Coupling
C15	.022	600	160-06122	P688-022	DF-203	PTE6D2		6TM-D22	Audio Coupling
C16	.0082	1600	160-16282			PTE16D8		MB-D8	Buffer Cap.
C17	.5	100	169-0001	P185-5		GT2P5		68P20	Hash Filter
C18	250	500	163-0250	1468-00025	D6-251	5W5T25	GP2K-251	1FM-325	Hash Filter

† Some Models use 0056MFD in this application (Part No. 160-02256)

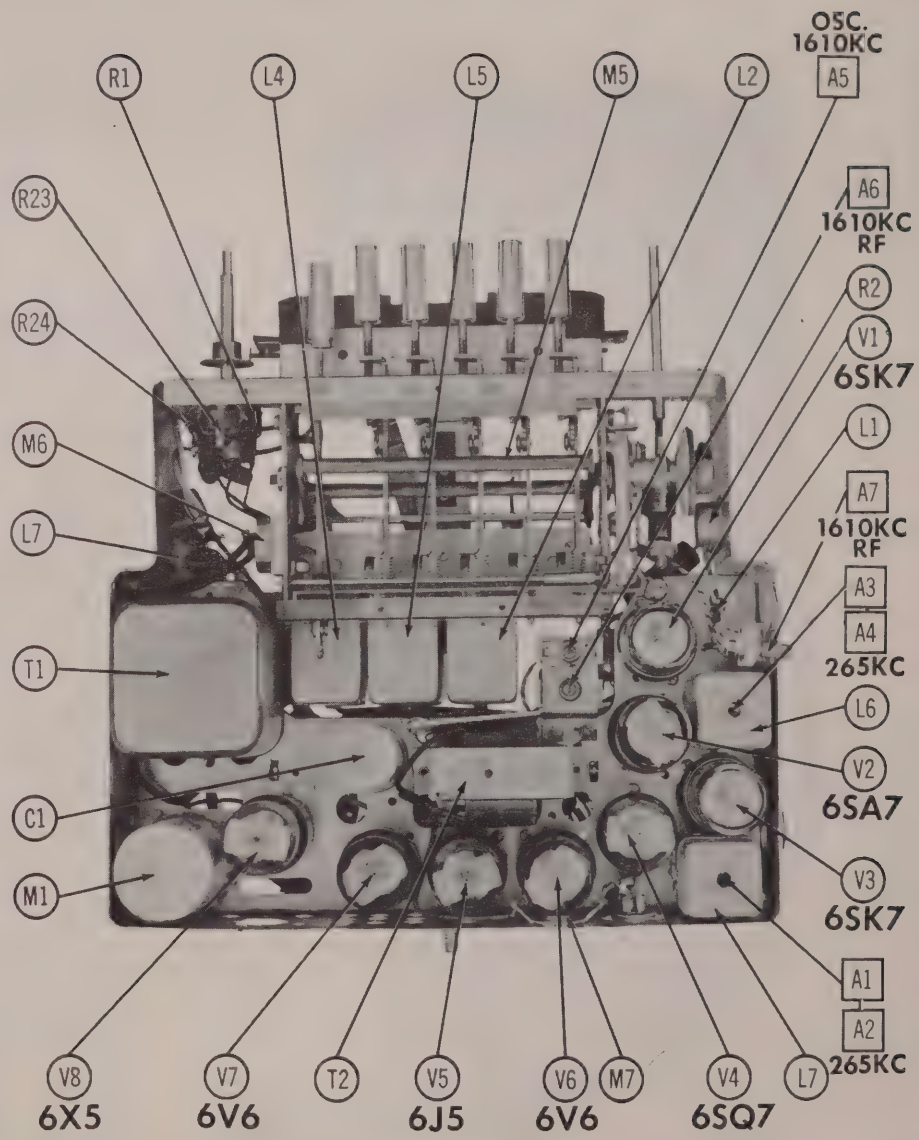
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: FORD PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1Meg	½	152-008				Tone Switch-4 Position
R2	2000Ω	1	159-0004				Sensitivity Control- Wire Wound

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: FORD PART No.	IRC PART No.	IDENTIFICATION CODES
R3	1Meg	½	181-0105	BTS-1Meg	RF Amplifier Grid
R4	10KΩ	1	182-0103	BTA-10K	RF Amplifier Plate
R5	330KΩ	½	181-0334	BTS-330K	Converter Grid
R6	22KΩ	½	181-0223	BTS-22K	Oscillator Grid
R7	10Meg	½	181-0106	BTS-10Meg	AVC Network
R8	33KΩ	½	181-0333	BTS-33K	Voltage Divider
R9	10KΩ	1	182-0103	BTA-10K	Screen Dropping
R10	1Meg	½	181-0105	BTS-1Meg	AVC Network
R11	470KΩ	½	181-0474	BTS-470K	Det. Diode Load
R12	220KΩ	½	181-0224	BTS-220K	Diode RF Filter
R13	15Meg	½	181-0156	BTS-15Meg	AF Amplifier Grid
R14	47Ω	½	181-0470		AF Amplifier Cathode
R15	330KΩ	½	181-0334	BTS-330K	AF Amplifier Plate
R16	56KΩ	½	181-0563	BTS-56K	Phase Inverter Grid
R17	2200Ω	½	181-0222	BTS-2200	Phase Inverter Cathode
R18	1500Ω	½	181-0152	BTS-1500	Feedback

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	FORD PART No.	IRC PART No.	
R19	39KΩ	½	181-0393	BTS-39K	Phase Inverter Plate
R20	330KΩ	½	181-0334	BTS-330K	Output Grid
R21	330Ω	1	182-0331	BTA-330	Output Cathode
R22	33KΩ	½	181-0333	BTS-33K	Output Grid
R23	100KΩ	½	181-0104	BTS-100K	Tone Compensation
R24	100KΩ	½	181-0104	BTS-100K	Tone Compensation
R25	1800Ω	2	183-0182	BTB-1800	Filter- Wire Wound
R26	82Ω	½	181-0820		Hash Suppressor
R27	82Ω	½	181-0820		Hash Suppressor
R28	5.1Ω	2	189-0014		Series Dial Light- Wire Wound

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	FORD PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	6.3VDC @ 3.8A	530VCT @ .060A			141-0010			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		FORD PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	8KΩ	3.4Ω	430Ω	.3Ω	143-0012	A-3852			

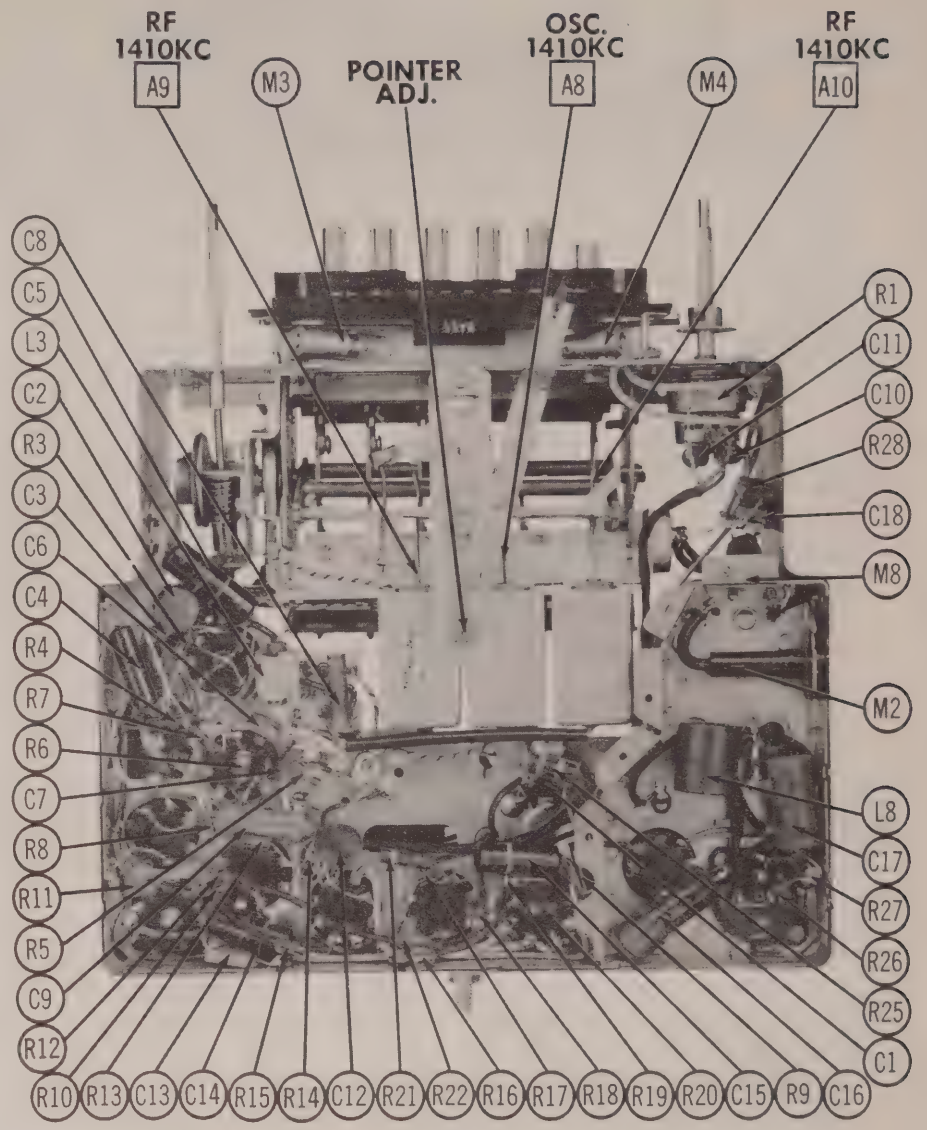
SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	FORD PART No.	JENSEN PART No.	QUAM PART No.	
SP1	P.M.	3.4Ω	539-0001 538-6901 *	ST-810 Mod. P69-V	69A3	* Alternate speaker used in some models
	CONE DIA.	V. C. DIA.				
SP2	6 1/4"X 9 1/8"	1"				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	FORD PART No.	MERIT PART No.	
L1	Ant. Hash Choke	.8Ω		148-0001		
L2	Ant. Coil	11Ω		111-0010		
L3	IF Trap			118-0008		Includes Capacitor
L4	RF Coil	11Ω		112-0008		
L5	Osc. Coil	.8Ω	4.6Ω	113-0020		
L6	Input IF	42Ω	52Ω	121-0015		
L7	Output IF	44Ω	44Ω	122-0015		
L8	Hash Choke	.1Ω		147-0007		
L9	Hash Choke	.1Ω		145-0005		

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA			INSTALLATION NOTES
				FORD PART No.	CORNELL-DUBILIER PART No.	RADIART PART No.	
M1	Interrupter	6.3V D.C.	115v	511-0001	5301	5301	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			FORD PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M2	SFE	14Amp.	191-0002	562-0007	307014	155014A	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					FORD PART No.		
M3	Bayonet	6-8	.25	Blue	611-0044		Type No #44
M4	Bayonet	6-8	.25	Blue	611-0044		Type No. #44

MISCELLANEOUS

ITEM No.	PART NAME	FORD PART No.	NOTES
M5	Tuner Unit	313-0016	Complete Assembly
A5	Trimmer	173-0002	Osc. Adj. (includes fixed trimmer)
A6	Trimmer	173-0002	RF Adj. (Includes fixed trimmer)
A7	Trimmer	172-0026	Ant. Adj.
	Dial Glass	489-0011	
	Dial Scale	722-0011	
	Pointer	791-0018	Complete Assembly
	Knob	744-0008	Tone
	Knob	741-0004	Tuning
	Knob	742-0002	Volume

PUSH BUTTON ADJUSTMENTS

Since the push buttons are mechanical, any button may be adjusted to any station within the receiver's tuning range.

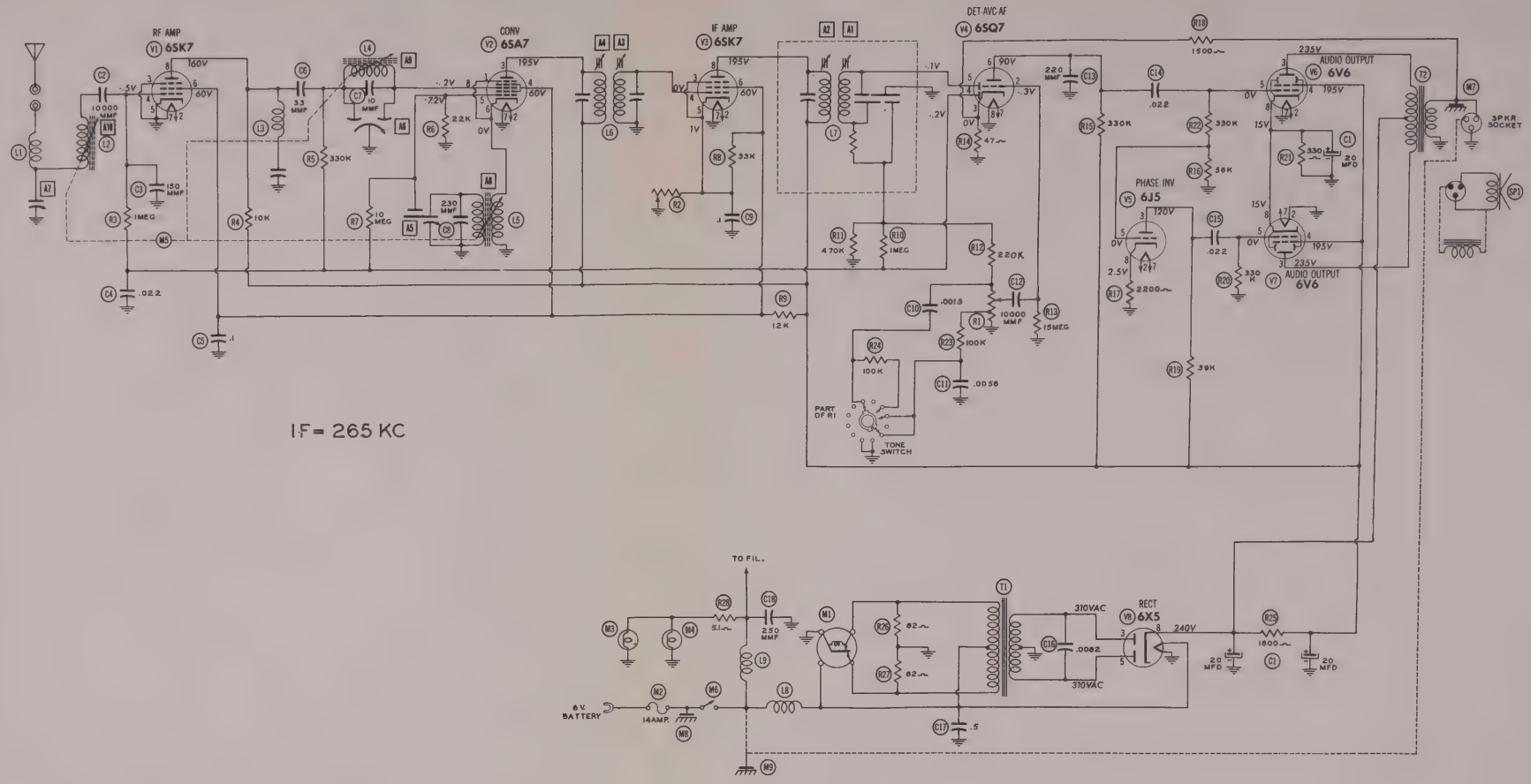
Carefully tune in the desired station manually.

With the fingers only, loosen the push buttons, (counter-clockwise) one turn.

Press the button all the way in, and then release it.

Tighten the button with your fingers by turning clockwise.

Repeat the above procedure for each push button.



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SK7GT	0Ω	.4Ω	0Ω	3Meg	0Ω	†14kΩ	0Ω	†12kΩ
V 2	6SA7GT	0Ω	.4Ω	†1.8kΩ	†14kΩ	22kΩ	.8Ω	0Ω	1.5Meg
V 3	6SK7GT	0Ω	.4Ω	130Ω	∞	130Ω	†14kΩ	0Ω	†1.8kΩ
V 4	6SQ7GT	0Ω	15Meg	47Ω	1.1Meg	320kΩ	†330kΩ	.4Ω	0Ω
V 5	6J5GT	0Ω	0Ω	†40kΩ	∞	56kΩ	INF.	.4Ω	2.2kΩ
V 6	6V6GT	0Ω	.4Ω	†215Ω	†1.8kΩ	385kΩ	280kΩ	0Ω	330Ω
V 7	6V6GT	47Ω	0Ω	†215Ω	†1.8kΩ	330kΩ	†14kΩ	.4Ω	330Ω
V 8	6X5GT	INF.	.4Ω	220Ω	INF.	300Ω	INF.	0Ω	30kΩ

* TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 8 OF V8
TONE SWITCH IN "NORMAL" POSITION

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1- DC Voltage measurements are at 20000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2- Socket connections are shown as bottom views.
3- Measured values are from socket pin to common negative.
4- Battery voltage maintained at 6.3 volts for voltage readings.
5- Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6- Volume control at maximum, no signal applied for voltage measurements.

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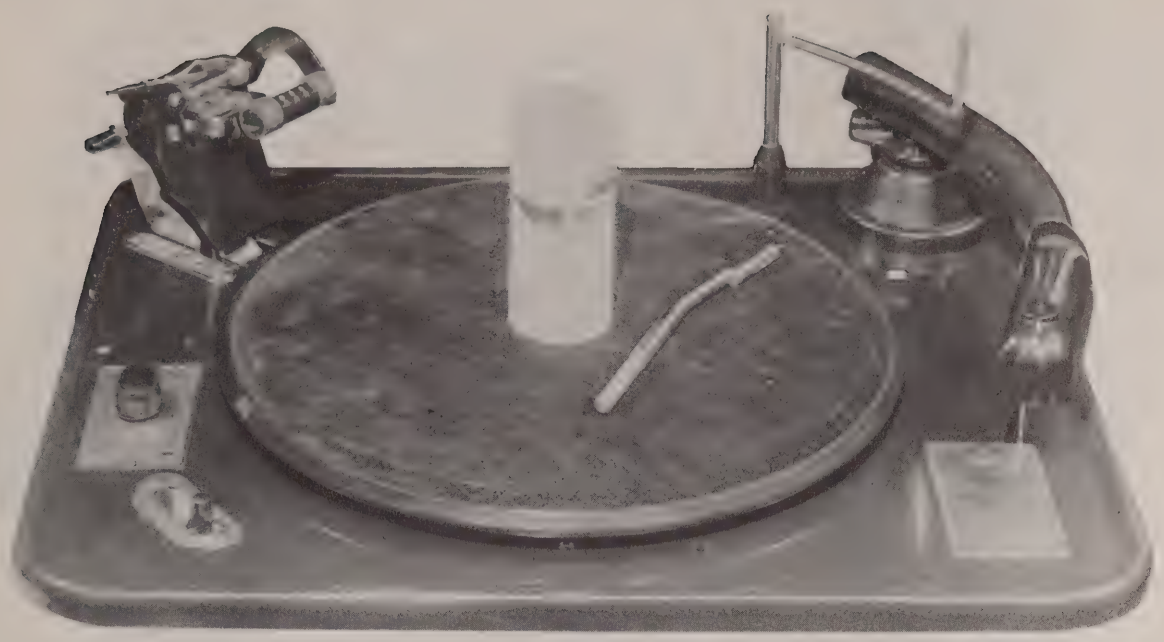
GARRARD
MODEL RC80



GARRARD
MODEL RC80

Figure 1

GENERAL INFORMATION

The Garrard Model RC80 Record Changer is designed to automatically play a series of ten 10" or 12" records at the speed of 78 RPM or 33-1/3 RPM. A full stack of ten 7", 33-1/3 RPM records or ten 7", 45 RPM records (using the large spindle) will also play on this changer.

This changer has the velocity trip type mechanism and automatic shutoff.

Power line voltage to the changer may be 100-130 or 200-250 volts, 60 cycles AC. For proper line voltage connections, see Figure 9.

Manufactured By:
The Garrard Engineering & Mfg. Co., Ltd.
Swindon, Wilts - England

Distributor:
Garrard Sales Corporation
164 Duane Street
New York 13, New York

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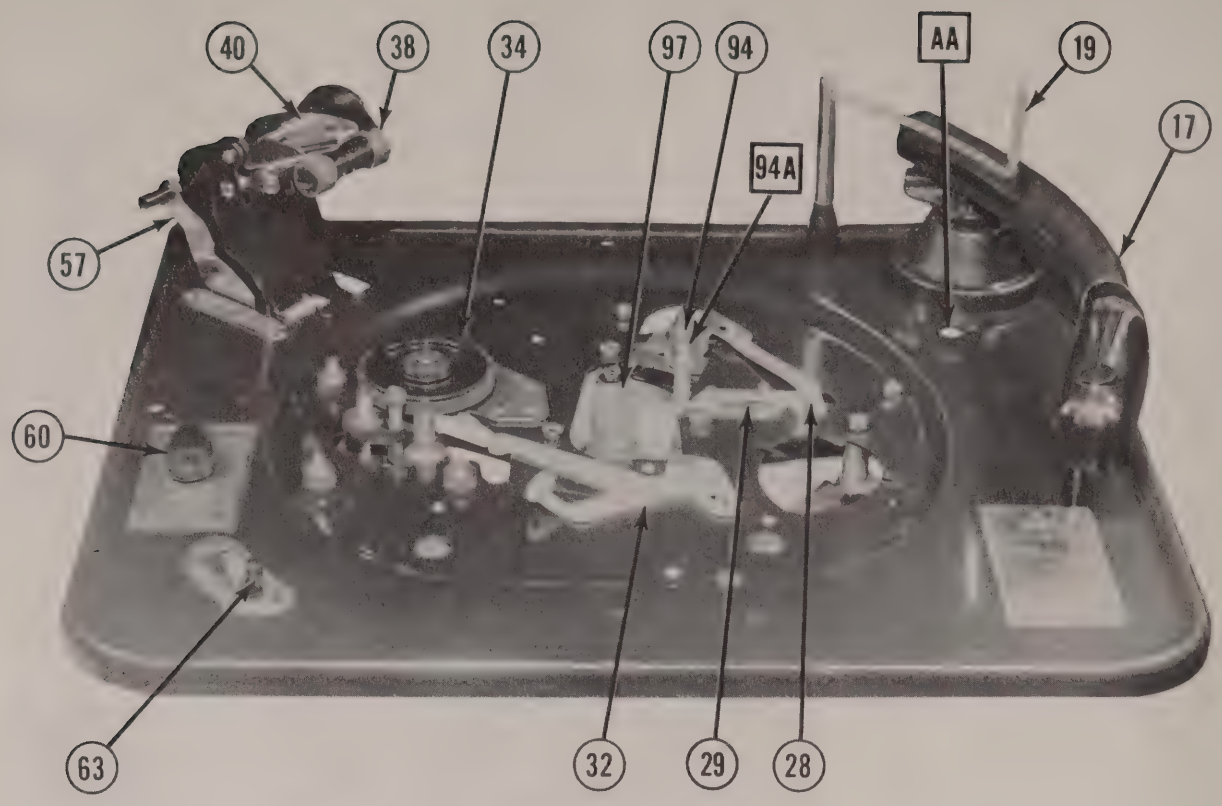

Figure 2

OPERATING INSTRUCTIONS

1. Insert the correct pickup head into position for type record to be played; i.e., one having a standard .002" to .003" radius needle for 78 RPM records, or .001" radius needle for 33-1/3 and 45 RPM records.

NOTE: Some Garrard Changers may come equipped with two plug-in heads (18), each having the correct weight and radius of needle for the type record to be played. To change pickup heads, loosen the set screw nearest the head and carefully pull on the head to remove it; then plug in the correct head. However, the changer may have the turnover type pickup in which the correct needle is obtained by turning over the pickup cartridge.

2. Place the correct spindle in position; i.e., the stepped sloping spindle for 78 or 33-1/3 RPM records, or the large spindle for 45 RPM records.

3. Set the change-over lever (57) to size record to be played- 7", 10", or 12". Also, turn the 7" record platform to the "Forward" position to play 7", 33-1/3 RPM records.

4. Turn the speed control knob (60) to the desired speed- 78, 45, or 33-1/3 RPM.

5. Place any number of records up to 10 (not mixed) on the record spindle.

6. Lower the record arm (38) to the records.

NOTE: The record arm (38) is not used when playing 7" records.

7. Move the "Stop-Start-Reject" knob (63) to the "Reject" position and release. The changer will now automatically play the stack of records on the spindle; it will also automatically return the tone arm to the arm rest and shut off upon completing the last record.

CHANGE CYCLE

The change cycle is put into operation by moving the "Stop-Start-Reject" knob (63) to "Reject". This causes the switch lever (70) to be latched with the switch catch (68), closing the switch. The motor is thereby started and, in turn, the turntable revolves. At approximately the same time, the reject lever (67) is moved against the trip catch (79), releasing the impulse lever (98). The impulse lever, actuated by spring (119), moves against the cam gear pin (103A), moving the cam enough for the clutch pawl segment (103B) to engage the pinion (97), which is revolving with the turntable. This, in turn, starts the rotating of the cycling cam (103)

As the cycling gear revolves, the lifting lever (115) is pivoted, due to the cam roller on lever (115) following the contour of cam (103C), see Figure 7. This, in turn, through its connected levers, closes the muting switch contacts (82) and causes the lifting crank (84) to engage the lifting plate and spindle assembly (83), thus raising the tone arm from the record.

Cam (103E) now pivots the tone arm actuator (93), causing the roller (93A) to engage the swing lever of the assembly (76), which, in turn, moves the tone arm out clear of the records. As the assembly (76) swings outward, the index lever of the assembly (76) moves against the pin on the tone arm positioning lever assembly (31). The index step to which the pin of the selector link (31) engages is determined by the setting of the change over lever (57). This positions the tone arm for set down.

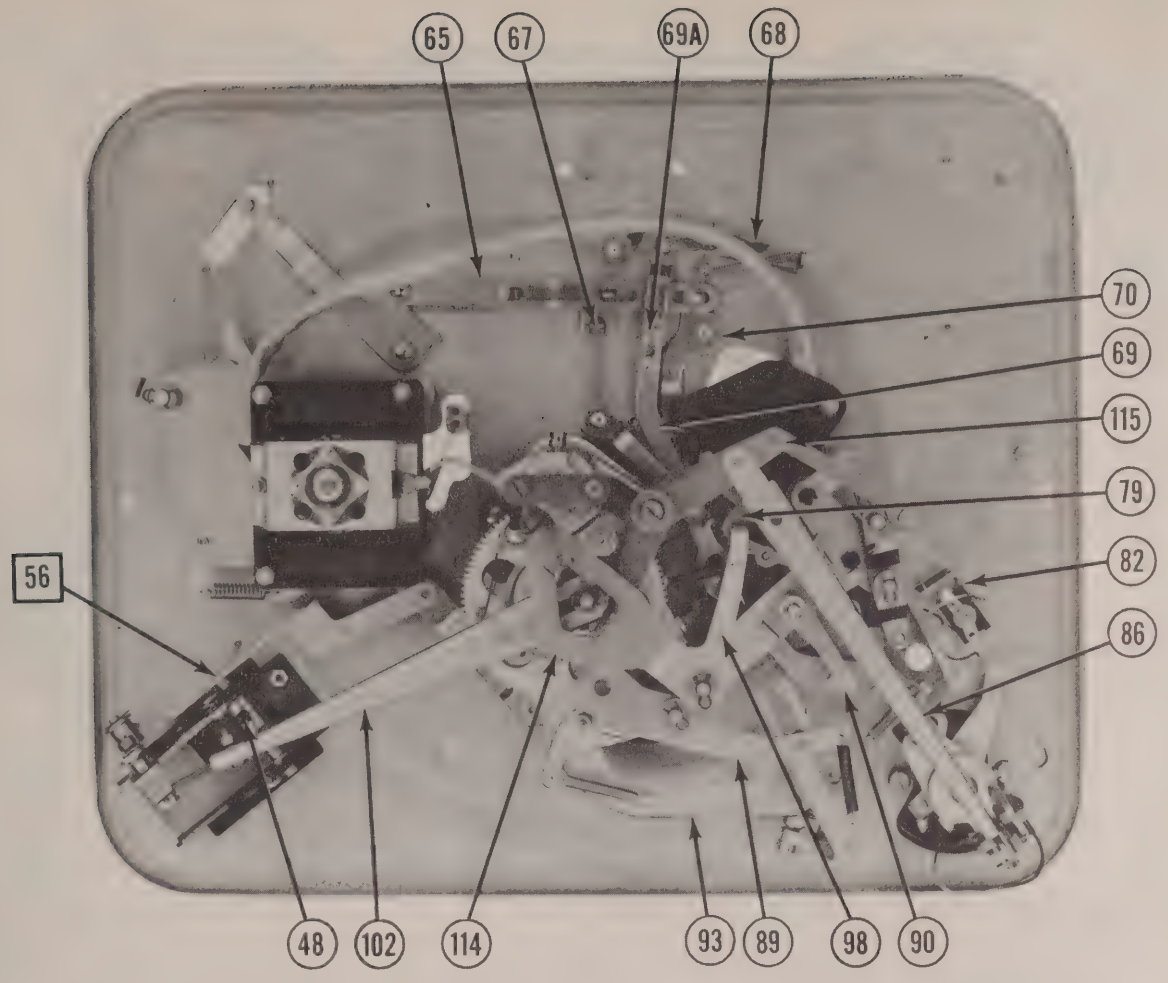

Figure 3

At approximately the same time, pin (103D) moves against the shut-off cam lever (89), allowing the discriminating lever (19) to be pulled inward; however, with records on the spindle, the discriminating lever (19) is blocked from making its full inward travel, thereby preventing the shut-off operation.

At this position of cam rotation, pin (103F), see Figure 7, has reached the end of the slot in the coupling link (102), and with continued cam rotation, the coupling link (102) is pushed back. This, in turn, actuates the link (46) and pawl (44), thus selecting the bottom record and dropping it to the turntable. At the same time, the 45 RPM spindle actuating lever assembly (114) is pivoted by the same pin (103F). This operates the 45 RPM spindle when used.

Pin (103F) now moves away from the end of the slot in the coupling link (102). This allows spring (47) to return the coupling link (102), link (46), and pawl (44) to their normal positions.

Lever (93) moves away from the swing lever of assembly (76), allowing spring (78) to pull the swing lever and, in turn, the tone arm inward until the eccentric set-down adjustment stud engages the index lever of assembly (76). This positions the tone arm for set-down.

Lever (115) now returns to its normal position; and, through the connected parts, the tone arm is lowered to the record and the muting switch is opened.

At approximately the same time, cam impulse lever (98) is reset with the trip catch (79) by cam pin (103A). The open section of the cam gear (103) is now facing the pinion (97), thereby completing the change cycle.

As the tone arm moves across the record, the trip arm (74), which is secured to the lift rod by a set screw, engages and moves the velocity trip link (28). This, in turn, pivots the velocity friction plate and trip lever (94) toward the pinion (97). While a record is playing, the small inward movement of the trip lever (94) is not sufficient to trip the mechanism, because, on each revolution of the pinion (97), the wiping contact by the pinion striker moves the trip lever (94) back.

In the first revolution of the turntable, during which the tone arm advances rapidly, the trip lever (94) is moved far enough to definitely engage the striker on the spindle (96). The trip lever is then raised by the striker which, in turn, pushes upon the trip crank rod (29). This moves the trip lever (79), releasing the impulse lever (98), which causes the cam to engage the pinion and thus start a new change cycle.

AUTOMATIC SHUTOFF:

When the last record has been played, the change cycle starts again. Since there are no records on the spindle, the switch-off arm is allowed to move in far enough for link (89A) to pivot the shut-off lever (90) so

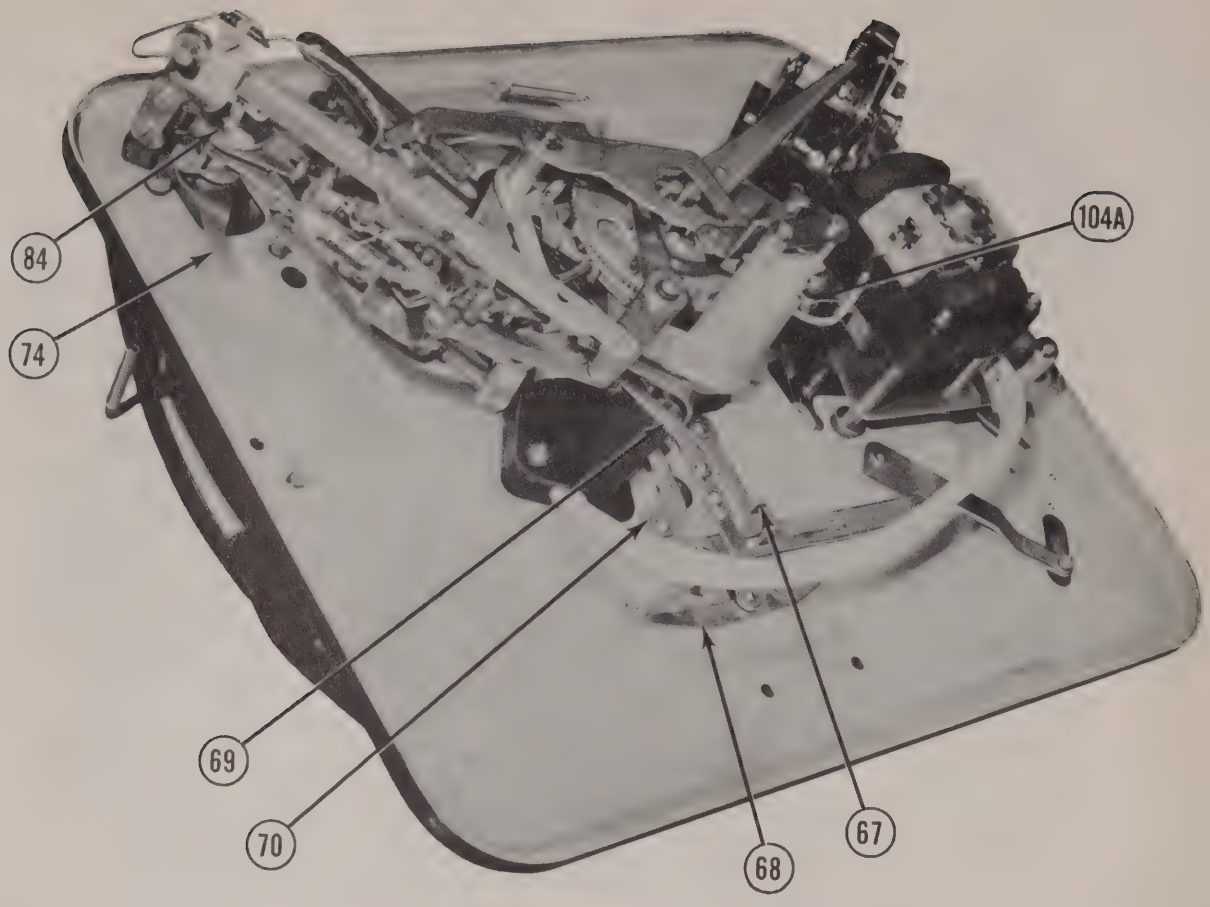

Figure 4

as to engage a pin on the lever (93). This prevents the swing lever (93) from following the contour of cam (103A), but holds it in a position so as to engage cam (103G). Cam (103G), now actuating lever (93), causes the lever (93) to move against the trip link (69). This releases the switch lever (70), shutting off the changer. The shut-off lever (90) is reset by the cam impulse lever (98) as it is being latched with the trip catch (79). Also, the tone arm is held in a locked position over the tone arm rest by the engagement of the lever roller (93A) and the muting switch lever (118) with the swing lever of assembly (78). This completes the shutoff cycle.

ADJUSTMENTS

Tone Arm Height -(See Figure 8) -

If the tone arm fails to clear the top record of a stack of ten records on the turntable, it may be adjusted as follows:

1. Loosen the hex nut holding the eccentric adjustment screw [84A.]

2. Adjust the eccentric screw [84A] and tighten the hex nut.

3. Place ten records on the turntable, trip the changer, and hold the switch-off arm (19) so that it will not move all the way in; at the same time, observe the movement of the tone arm to see if it clears the records. Readjust the eccentric [84A,] if necessary, to obtain the proper height.

Tone Arm Set-Down Point -

If, for any reason, the tone arm lever assembly (76) has been removed, the tone arm set-down point may be readjusted as follows:

1. Place a 10" record on the turntable.

2. Move the platform lever (57) to the 10" pos

3. Loosen the tone arm lever (76) clamp screw. Figure 8.

4. Push up on the lever assembly (76) so that it does not bind on any parts; then move it counterclockwise so that the index lever will just touch the pin on the end of the positioning lever (31).

5. While holding the lever assembly (76) in this position, move the tone arm in so that the needle will rest in the starting groove of the record; then tighten the clamp screw and check the adjustment.

6. A finer adjustment can now be made by turning the eccentric set-down pin (76A): See [AA] Figure 2.
   (a) To make this adjustment, move the tone arm out over the rest post. The eccentric pin may then be adjusted through the hole in the base plate. A quarter of a turn in either direction will give the maximum adjustment. After this adjustment has been made, switch on the changer and observe the landing of the tone arm, readjust, if necessary.

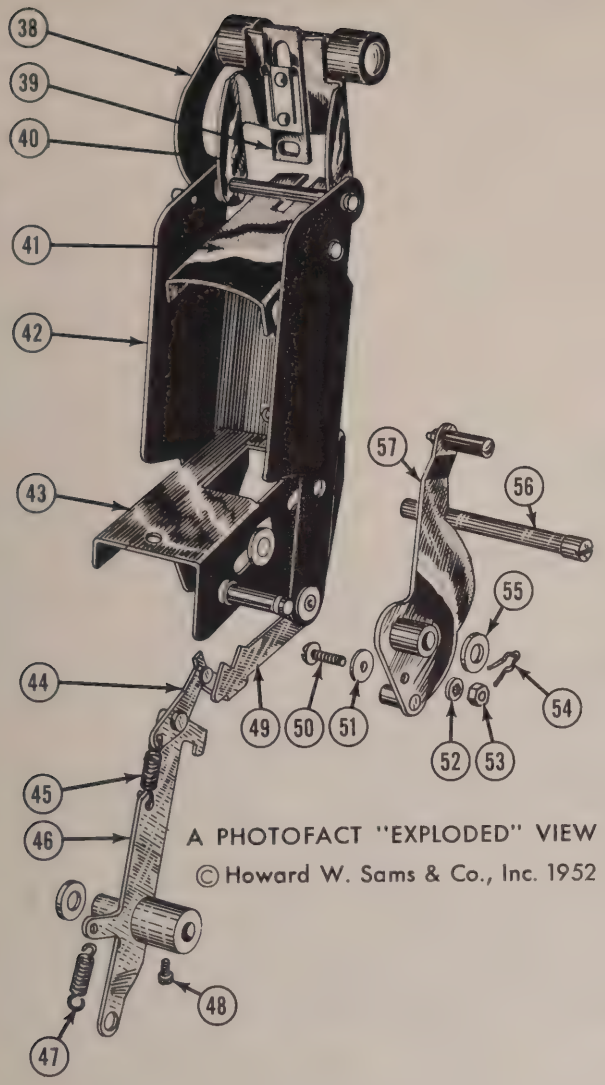

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Figure 5

Record Platform Adjustment -

The platform (42) has been properly adjusted at time of manufacture to accommodate records of average dimensions.

If, for any reason, the platform has been removed, it may be adjusted as follows:

1. After the record platform has been properly mounted, move the change over lever (57) to the 10" position.

2. Loosen the screw (48) in the platform pivot collar.

3. Place a 10" record on the turntable.

4. Turn the eccentric pin [56] until the platform is in the required position.

5. Tighten the screw (48), leaving a clearance of about 1/64" between the eccentric shoulder of the pin (56) and platform support (see Figure 3).

Record Drop Adjustment -

If the record ejector pawl (44) fails to move forward enough to drop a record to the turntable, make the following adjustment:

1. Set the platform lever to the 10" position.

2. With power removed from the changer, move knob (63) to "Reject"; then turn the turntable clockwise until the pawl (44) is in its maximum forward position.

3. Loosen the hex nut (101) and turn the eccentric adjustment screw [99] until the pawl is flush with the edge of the record support (41); then tighten the hex nut.

Velocity Trip Adjustment -

1. With power removed, push the "Start-Stop-Reject" knob to "Reject".

2. Rotate the turntable in a clockwise direction, allowing the changer to go through a complete change cycle.

NOTE: While rotating the turntable, hold the switch-off arm (19) so it will not swing in to actuate the shut-off mechanism. If the shut-off occurs, you will not be able to check the velocity trip.

3. Carefully remove the turntable.

4. Rotate the pinion clockwise, and move the tone arm all the way in.

5. Observe the automatic trip lever (94) to see if it rides up the incline of the striker. If it does not ride up the striker, but is pushed away, the trip lever will have to be raised to correct this condition.
   (a) To adjust the automatic trip lever height, turn the adjustment screw [94A] clockwise, about 1/4 turn. Check the adjustment by moving the tone arm out over the rest post so as to reset the trip arm; then follow Steps 4 and 5.

6. Replace the turntable.

TROUBLES

Tone Arm Does Not Land on Record Properly -

1. Tone arm not properly adjusted (See "Tone Arm Set-Down Point").

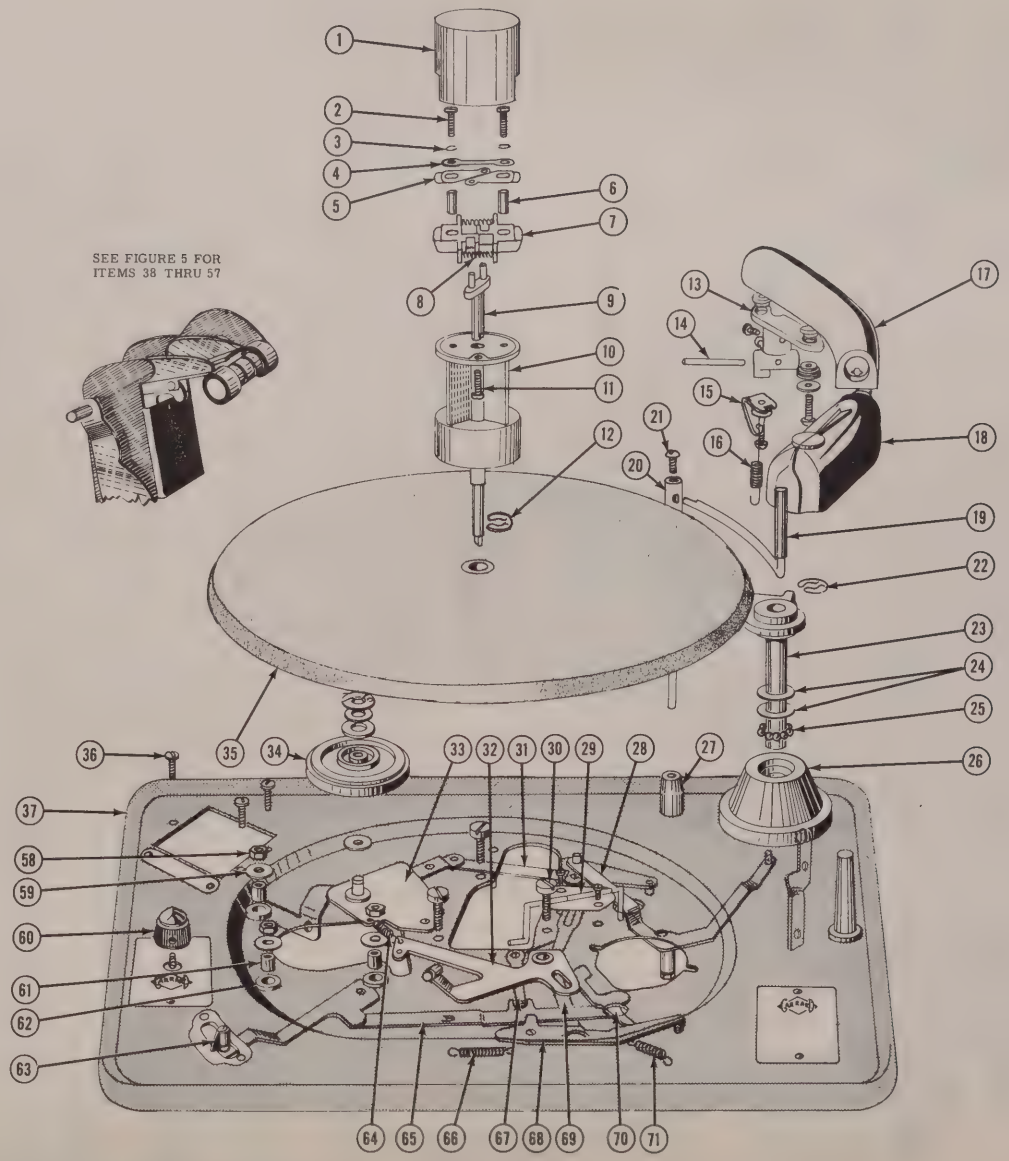
Changer Fails to Trip When "Stop-Start-Reject" Knob is Moved to "Reject -

1. Clutch lever spring (119) loose or missing:
   (a) If this spring is missing, the cam trip lever (98) will not move the cam (103) so as to engage the pinion (97).

Changer Will Not Trip at the End of a Record -

1. Automatic trip lever (94) not operating the trip crank:
   (a) See "Velocity Trip Adjustment".

2. Automatic trip pivot plate (29) may be loose; if this is true, the trip crank (29) may have slipped out of the hole in the trip catch (79):
   (a) See that the trip crank is inserted in the


SEE FIGURE 5 FOR
ITEMS 38 THRU 57
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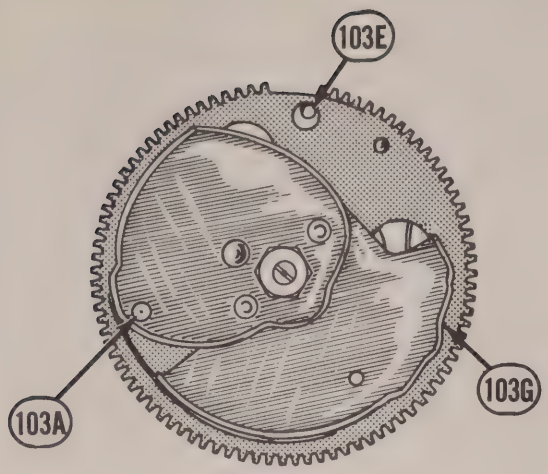


Figure 6

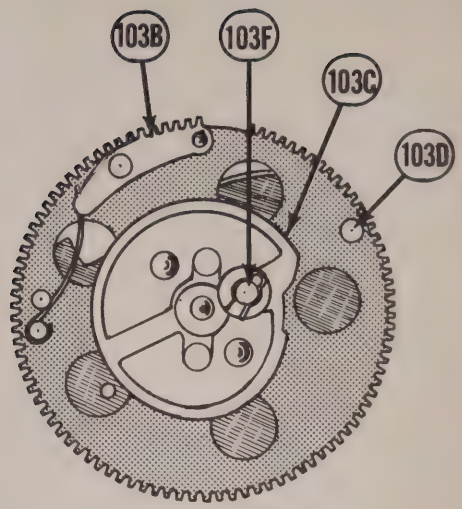


Figure 7

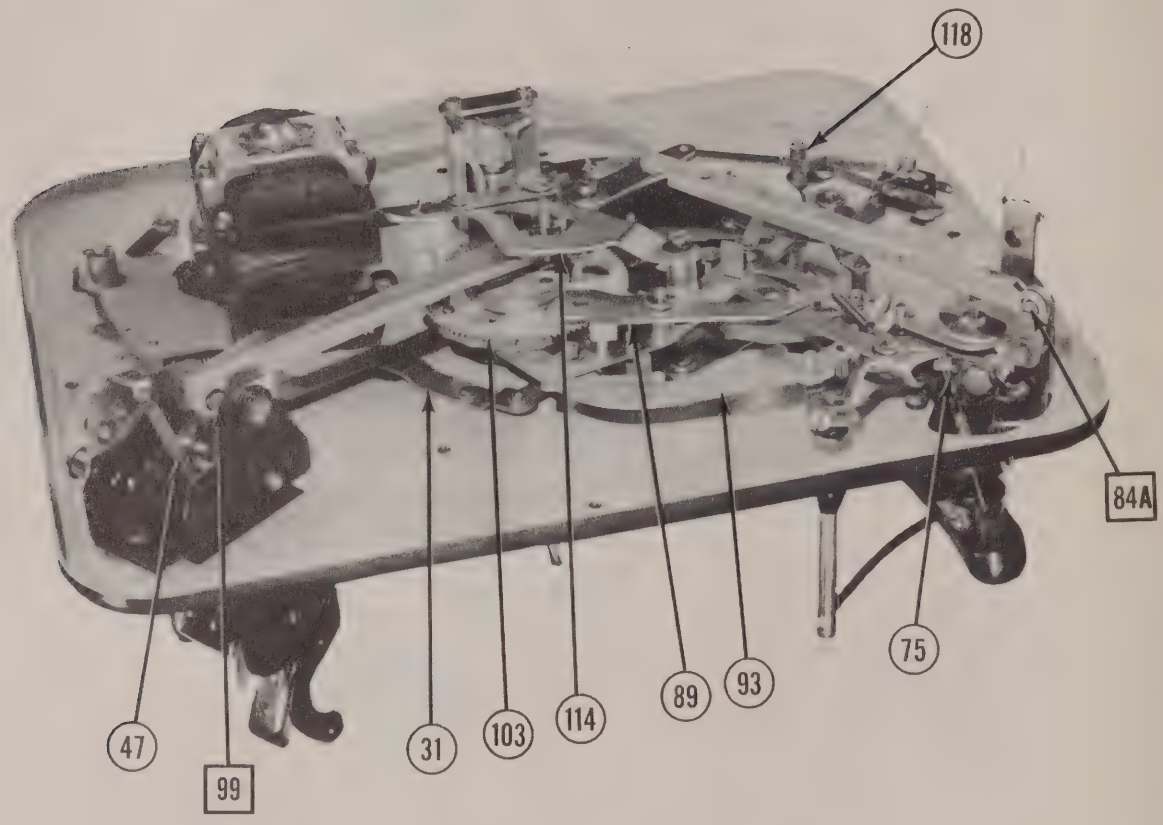


Figure 8

hole in the trip catch (79); then tighten the trip plate (29).

3. Clutch lever spring (119) loose or missing;
   (a) Replace.

Continuous Shut-Off -

1. Spring (120) loose or missing. If this spring is not connected to the lever (93), the lever (93) will follow cam (103G) which causes the mechanism to shut-off.

Changer Fails to Shut Off After Playing Last Record -

1. Spring (88) loose or missing. If the spring is loose, the shut-off lever (89) will not be held in a position to be actuated by the pin (103D), which, in turn, actuates the switch-off arm (19) and lever that operate the shut-off mechanism.

Tone Arm Moves to a Lock Position Upon Completing Last Record, but Motor Continues to Run -

1. Shut-off link out of adjustment:
   (a) If the screws (69A) are loose, or the long link (69) is at the end of the slot, the switch

catch will not move during shut-off operation, which then fails to release the switch lever (70). Adjust the link (69) so that it will trip the switch catch (68) as the cam trip lever (98) is being latched with the trip catch (79).

Needle Does Not Track Across Record Properly -

1. Needle may be clogged with accumulation of lint, dirt, etc.

2. Insufficient weight of the tone arm:
   (a) The weight of the tone arm is increased by pulling down on the tone arm weight adjusting screw (75) until the nut is clear of the bracket; then unscrew the nut to increase the weight. Approximately 6 grams can be added to the pickup weight by using the adjusting screw.

Speed Variation -

1. Oil, grease or foreign material on the drive surfaces of the mechanism:
   (a) Check the idler wheel, rubber drive belts, drive pulleys and turntable hub for grease, lint, etc. If there is foreign material on these parts, clean them with carbon tetrachloride.

2. Check the two belts to see if they run centrally on their pulleys;
   (a) If the belts don't run on their pulleys properly, turn the belts over; if this does not check the trouble, belts should be replaced.

3. Pinion (97) may be binding:
   (a) Remove the turntable and grip the pinion (97), lifting it up and down. If no movement is felt, loosen the two screws (104A), raise the pinion a very small amount, and retighten the screws (see Figure 4).

AC POWER CONNECTIONS

Connect both bars as illustrated for 200/250 volts

Connect both bars as illustrated for 100/130 volts

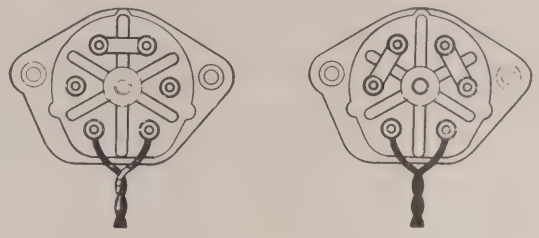


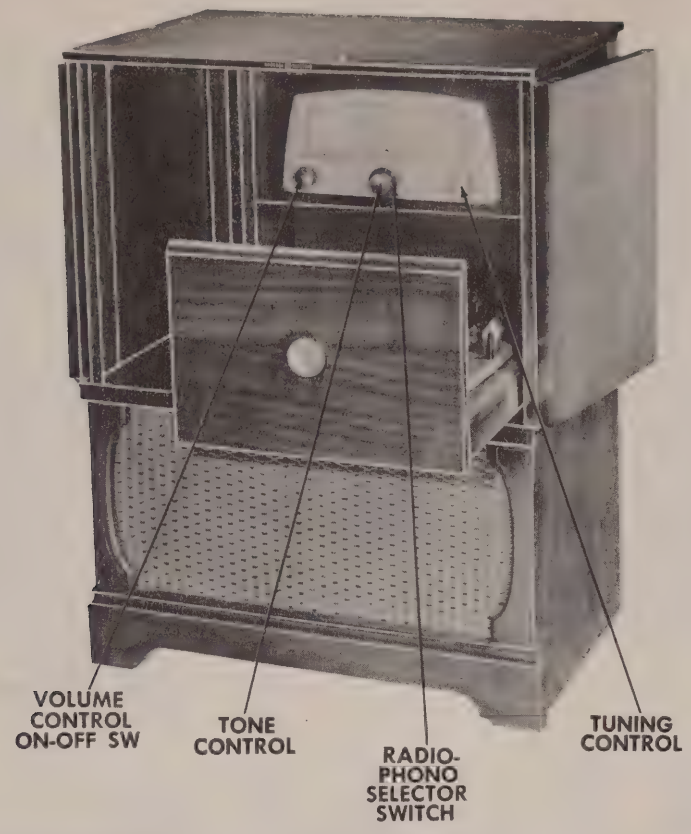
Figure 9

PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	A48506	Spindle Cap	28	A48715	Velocity Trip Link
	A48480	Spindle Assembly, complete	29	A48672	Trip Rod
2	A40218	Pawl Unit Mounting Screw		A48673	Mounting Plate for Trip Rod
3	A42527	Spring Washer, two used		A40014	Mounting Screw
4	A48502	Retaining Plate	30	A40027	Spindle Housing Mounting Screw
5	A48501	Separator	31	A48610	Selector Link
6	A48500	Pawl Bushing	32	A49256	Spring Tension Lever, with Felt Pad
7	A48496	Pawl, with Spring Pins		A45064	Felt Pad
8	A41604	Spring, two used		A42006	Rivet
9	A48503	Crank, with Pins		A45210	Collar
10	A48481	Support, with Spindles and Operating Collars		A40514	Washer
	A48487	Support only	33	A48614	Support Plate
10A	A48494	Record Center	34	A46524	Idler Wheel and Tire
11	A40130	Spindle Cap Mounting Screw		A41560	Spring Clip
12	A45087	Spring Clip		A40611	Felt Washer
13	A48941	Pickup Arm Mounting Bracket		A40614	Steel Washer
14	A48696	Pivot Pin, Pickup Arm Mounting Bracket		A40597	Presspahn Washer
			35	A48743	Turntable, complete
15	A48933	Anchor Plate	36	A40000	Mounting Screw, Record Platform Assembly
16	A41534	Counterbalance Spring		A42501	Spring Washer
17	B48691	Pickup Arm Assembly, complete		A41012	Nut
	B48940	Pickup Arm, with Bracket, Bushings and Screws	37	C48601	Baseplate Assembly
				C48603	Baseplate only
	C48693	Pickup Arm only	38	A48686	Record Arm, with Weight and Spindle
18	A49024	Pickup Head complete		A48689	Rubber Sleeve
19	A48931	Discriminating Lever		A40504	Washer
20	A48645	Bushing, Discriminating Lever		A41621	Spring Clip
21	A40309	Screw	39	A48685	7" Pawl
22	A45087	Spring Clip		A48934	Friction Plate
23	A48694	Pickup Arm Shaft, includes Pivot Bracket		A42009	Rivet
				A45180	Collar
24	A40558	Thrust Washers	40	A48683	7" Platform, with Pawl and Friction Plate
25	A43200	Ball Bearings			
26	A46706	Pickup Arm Mounting Base		A48684	7" Platform only
27	A48932	Discriminating Lever Mounting Base			

Ref. No.	Part No.	Description
41		10 and 12" Record Platform
42	B48654	Platform Bracket and Lever Assembly
43		Platform Pivot Channel
44		10 and 12" Record Ejector Pawl
45	A41503	Spring for Pawl
46	A48674	Operating Lever, with Pawl and Spring
	A48675	Operating Lever Only
47	A41506	Spring
48	A40000	Set Screw
49	A48671	Locating Lever
50	A40023	Screw
51	A40515	Washer
52	A42501	Spring Washer
53	A41012	Nut
54	A41560	Spring Clip
55	A40504	Washer
56	A48939	Pivot Spindle
57	A48657	Change-Over Lever, with Bushing and Roller
	A45271	Roller Pin
	A47981	Roller
	A40511	Washer
58	A41012	Nut
59	A40560	Washer
60	B48762	Knob
	A40307	Screw
	A41004	Nut
61	A46653	Rubber Collar
62	A46652	Rubber Bushing
63	A47438	Knob
	A42527	Spring Washer
	A41008	Nut
64	A41614	Spring
65	A47158	Switch Link
66	A41602	Spring for Switch Link
67	A48612	Reject Lever
68	A47261	Catch Lever, with Trip Link Extension
	A46972	Catch Lever only
69	A47282	Grip Link Extension
70	A49254	Switch Lever, with Insulator and Contact
71	A41503	Spring for Catch Lever
72	A43200	Ball Bearings
73	A40558	Thrust Washers
74	A48725	Setting Lever, with Bushing
	A40040	Mounting Screw for Setting Lever
75	A40310	Needle Pressure Adjusting Screw
	A48938	Spring Bracket, with Stud
	A41008	Nut
76	A48697	Pickup Lever, with Pickup Selector Lever
	A48698	Pickup Lever only
76A	A46989	Eccentric Adjusting Pin
	A41582	Spring
	A40515	Washer
	A43311	Split Pin
77	A48243	Change-over Block Assembly
78	A41506	Spring for Pickup Lever
79	A48710	Trip Lever, with Bushing
80	A41602	Spring for Trip Lever
81	A48907	Switch Plate, with Pin
82	A48909	Switch Block, with Blades
83	A46597	Lifting Spindle, with Lifting Plate and Leatheroid Washer
84	A49263	Lifting Crank, with Disc and Bracket
	A40609	Felt Washer
85	A41618	Lifting Spring
86	A46728	Lifting Link
87	A41506	Spring for Lifting Crank
88	A41508	Shut-off Spring
89	A48732	Shut-off Cam Lever, with Bushing
89A	A48734	Shut-off Link
	A45161	Collar
	A40514	Washer
	A42005	Rivet
90	A48731	Shut-off Lever, with Shut-off Cam Lever and Link
	A40018	Screw
	A40504	Washer
	A41006	Nut
91	A41506	Spring for Cam Stop Lever
92	A45372	Retaining Ring
93	A48712	Swing Lever, with Bushing, Pin and Roller
93A	A47981	Roller
94	A48721	Grip Lever, with Spring Clip and Felt Pad
	A41625	Spring Clip
	A42002	Rivet
	A48724	Pad Clip
	A48834	Felt Pad
94A	A48835	Friction Pad Screw, with Friction Pad
95	A48705	Bridge, with Pivot Pins
96	A48652	Fixed Spindle
97	A48640	Main Spindle
98	A47277	Impulse Lever
99	A46733	Eccentric Adjusting Screw
100	A42501	Spring Washer
101	A41012	Nut
102	A46735	Coupling Link
103	B48647	Cam Unit complete, with Gear Assembly
104	B48639	Main Spindle Housing
105	A46522	Thrust Race
	A40558	Thrust Washer
	A43200	Ball Bearings
106	A48581	Rubber Belt
107	A48594	Motor Pulley-60 Cycles
	A49329	Motor Pulley-40 Cycles
	A48595	Motor Pulley-50 Cycles
108	A41627	Spring
109	B48752	Motor Mounting Plate Assembly complete, with Levers, Pulley and Bushings
110	A48886	Spacer
111	C48751	Motor, Model D18 (for A.C. units)
	C49160	Motor, Model D.C.18 (for D.C.units)
112	A48923	Center Plate Mounting Screws
113	A40023	Center Plate
114	A48737	Center Cam Lever, Link and Center Spindle Unit
115	B48701	Lifting Lever, with Lifting Link, Connecting Link and Muting Switch Lever
116	A48861	Pulley, with Bearings-33-1/3 R.P.M.
117	A48858	Pulley, with Bearings-45 R.P.M.
118	A48911	Muting Switch Lever, with Pin and Roller

GENERAL ELECTRIC
MODEL 741



GENERAL ELECTRIC
MODEL 741

TRADE NAME	General Electric Model 741
MANUFACTURER	General Electric Co., Electronics Dept., Electronics Park, Syracuse, N.Y.
TYPE SET	AC Operated Radio-Phono Combination Superheterodyne Receiver with Loop Antenna.
TUBES (SIX)	Types 12SK7 RF Amp., 12SA7 Conv., 6AU6 IF Amp. -Phono Pre Amp., 12SQ7 Det.-AVC-AF Amp., 50L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	105-120 Volts AC RATING .3 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to Pin 8, (Grid), of 12SA7, (V2). Low side to B -.	455KC (400~Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation
2.	"	High side to Pin 4, (Grid), of 12SK7, (V1). Low side to B -.	1620KC	"	"	A5	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
3.	"	"	1500KC	Tune for max. output.	"	A6	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
4.		Loop	"	"	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT - SEE PHOTOFACT SET #107 - FOLDER 13 OR RECORD CHANGER MANUAL CM-3

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	INSTALLATION NOTES
		G. E. PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	12SK7	12SK7	8N	
V2	Converter	12SA7	12SA7	8R	
V3	IF Amp. -Pre Amp.	6AU6	6AU6	7BK	
V4	Det.-AVC-AF Amp.	12SQ7	12SQ7	8Q	
V5	Power Output	50L6GT	50L6GT	7AC	
V6	Rect.	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	G. E. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	50	150	RCE-135	PRS150/50-50		BRD5515A		TVA-2453	Filter (Red)
B	50	150							Filter (Yellow)
C2	.005	400	UCC-039	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	RF Coupling
C3	.005	400	UCC-039	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Ant. Isolation
C4	.05	400	UCC-045	P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C5	2.2		RCN-039	SI2.2NP0	TCZ-2.2		NP0K-2R2		RF Coupling
C6	.02	400	UCC-041	P488-02	DF-203	PTE4S2		4TM-S2	Decoupling
C7	47	500	UCG-020	1468-00005	D6-470	5W5Q5	GP1K-470	1FM-45	Osc. Grid Cap.
C8	.1	200	RCC-110	P288-1	DF-104	PTE4P1		2TM-P1	Audio Coupling
C9	.01	600	UCC-040	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	IF Amp. Plate
C10	.05	400	UCC-045	P488-05	DF-503	PTE4S5		4TM-S5	IF Amp. Screen
C11	.005	400	UCC-039	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Coupling
C12	.01	600	UCC-040	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling
C13	.005	400	UCC-039	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Tone Comp.
C14	.47	200	UCC-048	P288-47		GT2P5		2TM-P47	RF Bypass
C15	.002	400	UCC-036	P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Tone Comp.
C16	.002	400	UCC-036	P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Tone Comp.
C17	.005	400	UCC-039	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Coupling
C18	220	500	UCG-1036	1468-00025	D6-221	5W5T25	GP2K-221	1FM-325	AF Amp. Plate
C19	.01	600	UCC-040	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling
C20	.005	600	UCC-039	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Power Output Plate
C21	.05	600	UCC-045	P688-05	DF-503	PTE6S5		6TM-S5	Line Filter
C22	.05	400	UCC-045	P488-05	DF-503	PTE4S5		4TM-S5	Line Isolation
C23	.05	400	UCC-045	P488-05	DF-503	PTE4S5		4TM-S5	Line Isolation

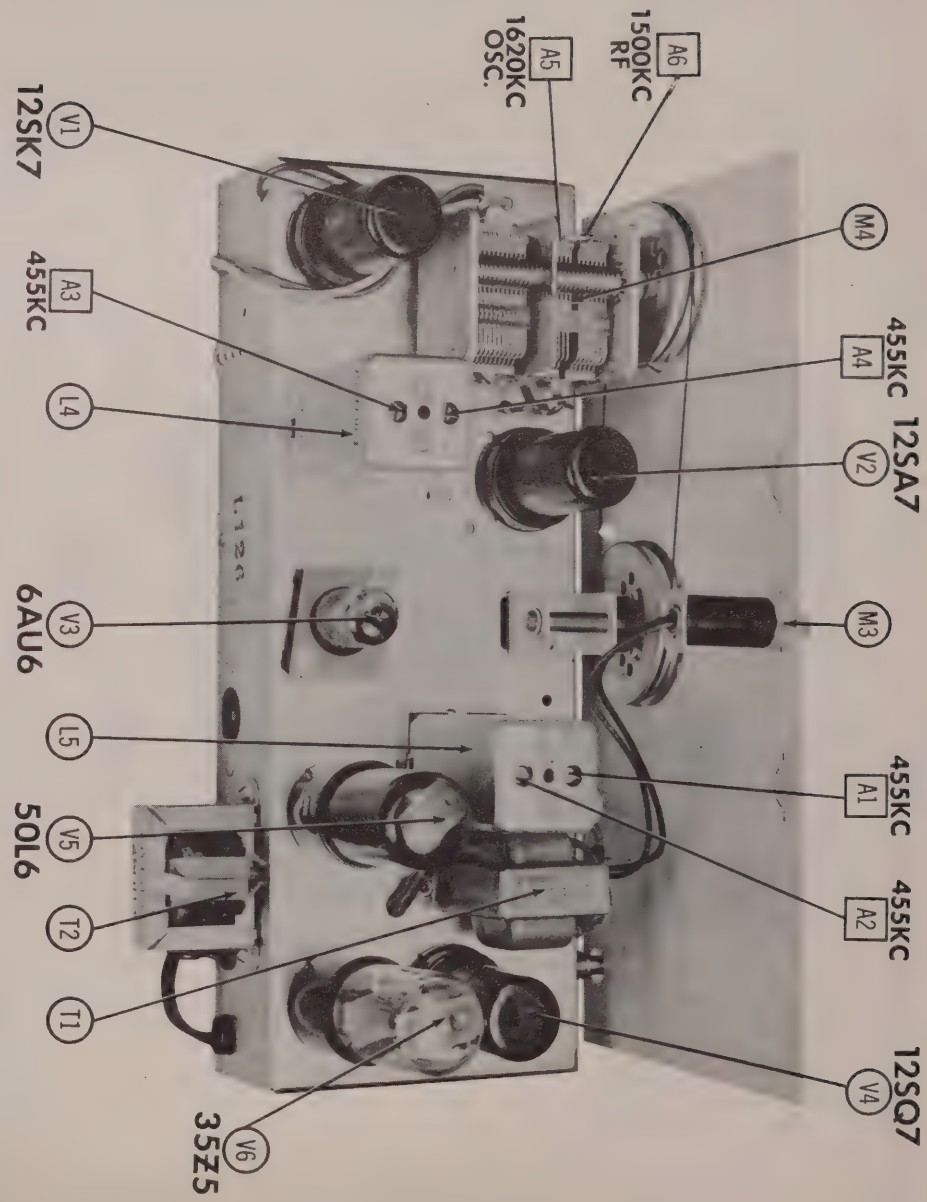
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	G. E. PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	2Meg	½	RRC-151	Q18-138X	AT-121	AN-76	Volume Control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-2	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SW-A	K-155	
R2	4Meg	½	RRC-167				Tone Control & Function Switch

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	G. E. PART No.	IRC PART No.	
R3	470KΩ	½	URD-113	BTS-470K	Isolation
R4	100Ω	½	URD-025	BTS-100	RF Amplifier Cathode
R5	22KΩ	½	URD-081	BTS-22K	Oscillator Grid
R6	1000Ω	½	URD-049	BTS-1000	IF Amplifier Grid
R7	4.7Meg	½	URD-137	BTS-4.7Meg	IF Amplifier Grid
R8	220Ω	½	URD-003	BTS-220	IF Amplifier Cathode
R9	1.1Meg	½	URD-123	BTS-1.2Meg	IF Amplifier Screen
R10	2200Ω	½	URD-057	BTS-2200	IF Amplifier Plate
R11	470KΩ	½	URD-113	BTS-470K	IF Amplifier Plate
R12	100KΩ	½	URD-097	BTS-100K	Decoupling
R13	20Meg	½	URD-149	BTS-18Meg	AVC Network - See Note 1

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	G. E. PART No.	IRC PART No.	
R14	2.2Meg	1/2	URD-129	BTS-2.2Meg	AVC Network
R15	10KΩ	1/2	URD-073	BTS-10K	Tone Compensator
R16	1000Ω	1/2	URD-049	BTS-1000	Decoupling
R17	330KΩ	1/2	URD-109	BTS-330K	Detector Diode Load
R18	1 Meg	1/2	URD-121	BTS-1Meg	Output Grid
R19	470KΩ	1/2	URD-113	BTS-470K	AF Amplifier Plate
R20	20Meg	1/2	URD-149	BTS-18Meg	AF Amplifier Grid - See Note 1
R21	220KΩ	1/2	URD-105	BTS-220K	Tone Compensator
R22	150KΩ	1/2	URD-101	BTS-150K	Tone Compensator
R23	100KΩ	1/2	URD-097	BTS-100K	Tone Compensator
R24	100KΩ	1/2	URD-097	BTS-100K	Tone Compensator
R25	1000Ω	2	URF-049	BTB-1000	Filter
R26	15Ω	1/2			Surge Limiter

Note 1. Some Models use a .5Meg Resistor in this application

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	G. E. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @.03A	6.3VCT @.45A			RTF-008	P-6134①	P-2944①	FO-63①

① Drill One New Mounting Hole

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		G. E. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	2KΩ tapped @50Ω	3.2Ω	180Ω tapped @8Ω	.6Ω	RTO-111	A-3330	A-3031	RO-2②	② Add extra Filter to reduce hum level.

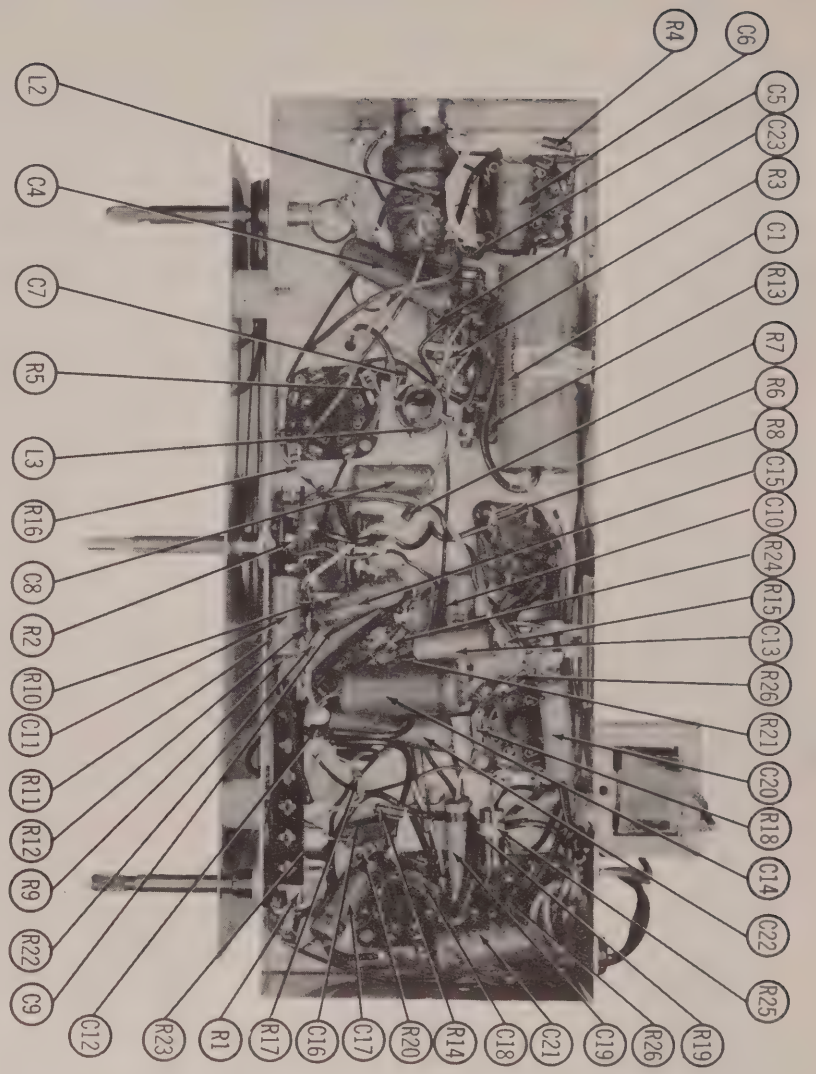
SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	G. E. PART No.	VIKING PART No.	QUAM PART No.	
SP1	P.M.	3.2Ω	ROP-018	10J12	10A31	
	CONE DIA.	V. C. DIA.				
SP2	9 3/4"	3/4"				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	G. E. PART No.	MERIT PART No.	
L1	Loop Ant.	.1Ω	2.2Ω	RAB-168		
L2	RF Coil	90Ω	13Ω	RLI-125		Tap at 10Ω
L3	Osc. Coil	.7Ω	7.8Ω	RLC-105		
L4	Input IF	17.5Ω	17.5Ω	RTL-115		
L5	Output IF	28Ω	28Ω	RTL-116		

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA						REMARKS
	G. E. PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	RPX-048							

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

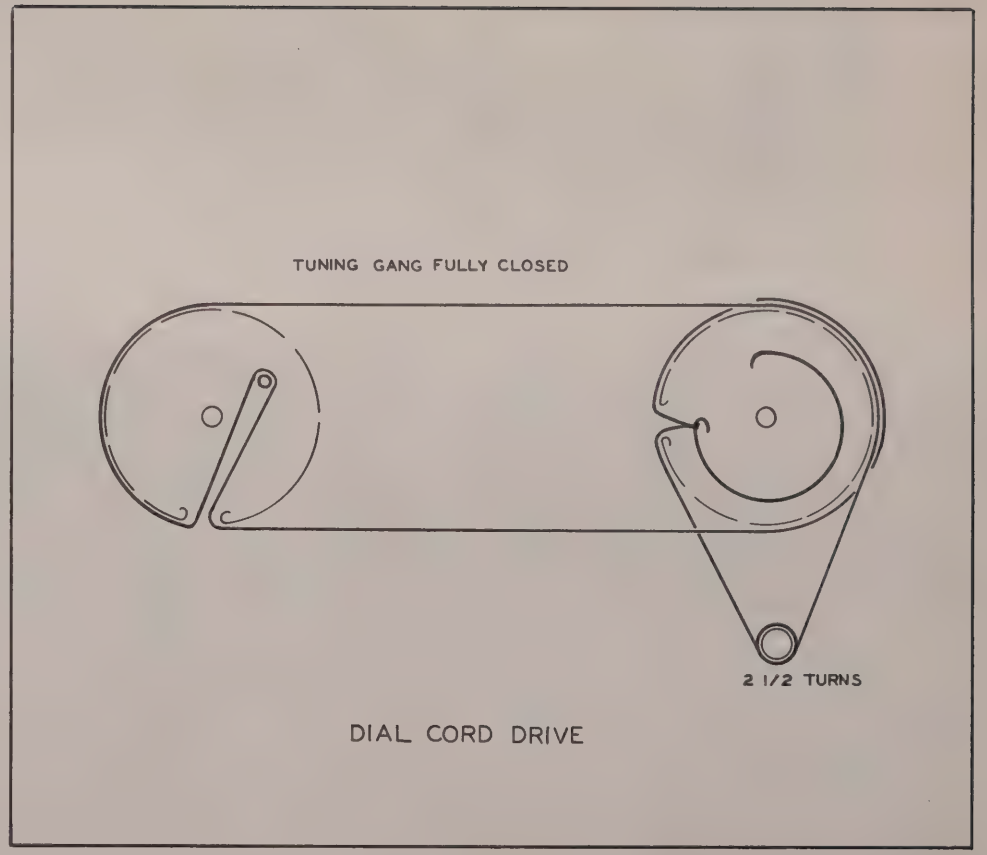
ITEM No.	REPLACEMENT DATA			REMARKS
	G. E. PART No.	WALCO PART No.	JENSEN PART No.	
M2	RPJ-014	W-66TPS		

DIAL LIGHTS

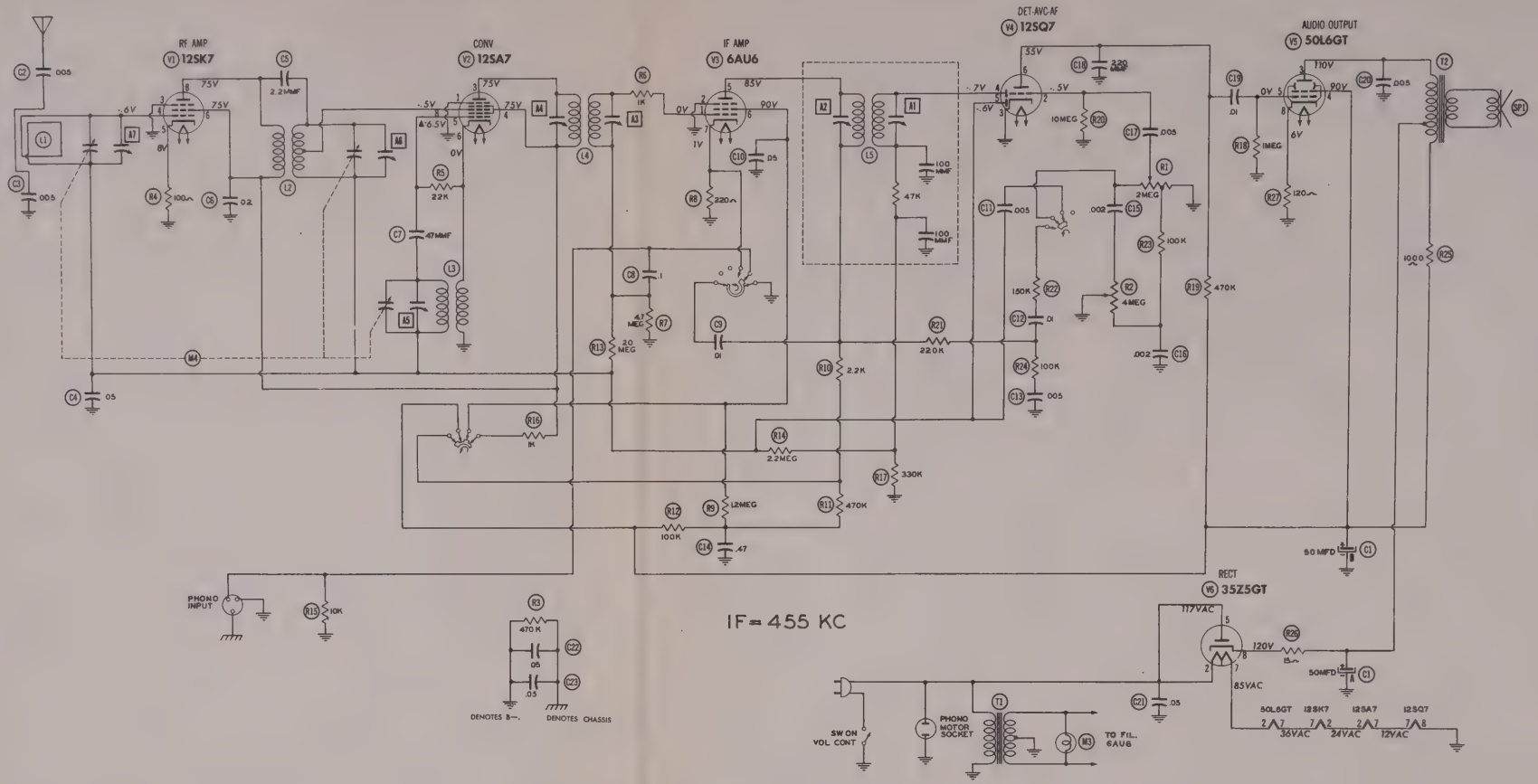
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					G. E. PART No.		
M3	Bayonet	6-8	.15	Brown			Type No. 47

MISCELLANEOUS

ITEM No.	PART NAME	G. E. PART No.	NOTES
M4	3 gang Var. Cap.	RCT-048	(18-445MMF, 15-212MMF, 18-157MMF)
A7	Trimmer	RCY-016	Ant. Adj.
	Cabinet	RAV-171	
	Pointer	RDP-062	
	Dial Scale	RDS-108	
	Knob	RDK-257	Vol. On/Off, Tuning
	Knob	RDK-258	Radio-Phono Sw.
	Knob	RDK-259	Tone



DIAL CORD DRIVE



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SK7	∞ 0Ω	24Ω	0Ω	2.5Meg	100Ω	†2KΩ	38Ω	†2KΩ
V 2	12SA7	∞ 0Ω	24Ω	†2KΩ	†2KΩ	22KΩ	.6Ω	12Ω	2.5Meg
V 3	6AU6	3.2Meg	0Ω	.7Ω	.7Ω	†3.2KΩ	†1KΩ	220Ω	
V 4	12SQ7	∞ 0Ω	10Meg	0Ω	375KΩ	2.5Meg	†470KΩ	12Ω	0Ω
V 5	50L6GT	Inf.	86Ω	†200Ω	†1KΩ	1Meg	0Ω	36Ω	120Ω
V 6	35Z5GT	Inf.	128Ω	110Ω	115Ω	120Ω	†25Ω	85Ω	40KΩ

▲ TAKEN WITH VACUUM TUBE VOLTMETER
ALL MEASUREMENTS TAKEN IN "RADIO" POSITION
† MEASURED FROM PIN 8 OF V6
■ MEASURED FROM "1" [illegible]

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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OLDSMOBILE
MODELS 982543, 982579

OLDSMOBILE
MODELS 982543, 982579

OLDSMOBILE MODEL 982579

TRADE NAME	Oldsmobile Models 982543, 982579
MANUFACTURER	Oldsmobile Motors., Div. of Genersl Motors, Lansing , Mich.
TYPE SET	Custom Built Automobile Superheterodyne Receiver
TUBES (SEVEN)	Types 6SK7GT RF Amp., 6SA7 Conv., 6SK7GT IF Amp., 6SR7GT Det.-AVC-AF Amp., (2) 6V6GT Power Output, 0Z4 Rectifier
POWER SUPPLY	6 Volt Storage Battery RATING 7.5 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	535-1610 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 8, (grid) of 6SA7, (V2) Low side to chassis.	257.5KC (400%)	Tuning cores fully out. (High freq. end.)	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	70MMF	High side to ant. receptacle. Low side to chassis.	1610KC	"	"	A5, A6. A7	Adjust for maximum output.
	The following should be performed only after a coil or core has been replaced or tampered with.						
3.	70MMF	High side to ant. receptacle. Low side to chassis.	1400KC	Turn cores completely out of coils. Turn tuning control until core carriage moves .315 ins. inward from high freq. stop.	Across voice coil.	A8, A9. A10	Adjust pointer until dial reads exactly 1400KC. Adjust A8, A9, and A10 for maximum output. Rock tuning gang while adjusting A8. Repeat steps 2 and 3 until no further improvement can be made.

After set is installed, fully extend the antenna and tune in a weak station near 1400KC. Retouch A7 for maximum volume.

PUSHBUTTON ADJUSTMENTS

Since the pushbuttons are mechanical, any button may be adjusted to any station within the receiver's tuning range. Carefully tune in the desired station manually.
With finger pressure only, press the button to the left and pull outward. Push the button all the way in. Repeat this procedure for each button.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: OLDSMOBILE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	INSTALLATION NOTES
V1	RF Amp.	1214292	6SK7GT	8N	
V2	Converter	7237752	6SA7	8R	
V3	IF Amp.	1214292	6SK7GT	8N	
V4	Det. -AVC. AF Amp.	1218149	6SR7GT	8Q	
V5	Audio Output	1213793	6V6GT	7AC	
V6	Audio Output	1213793	6V6GT	7AC	
V7	Rect.	1211924	0Z4	4R	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: OLDSMOBILE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	10	350	1218009	AFH3-104		UP115S35C		TVL-3630	■Filter
B	15	350							▲Filter
C	20	25							Output Cathode
C2	.05	200	7230592	P288-05	DF-503	PTE4S5		2TM-S5	AVC Filter
C3	27	500	7256259	SI27	D6-270	5W5Q3	GP1K-270	MS-43	RF Coupling
C4	10	500	7234242	1468-00001	D6-100	5W5Q1	GP1K-100	MS-41	RF Coupling
C5	18	500	1217733	SI18	D6-180	5W5Q2	GP1K-180	MS-42	RF Coupling
C6	150	500	7230893	1469-00015		5R5T15			Fixed Trimmer
C7	50	500	1207625	1469-00005		5R5Q5		MS-45	Osc. Grid Cap.
C8	235		1219305						Fixed Trimmer
C9	.05	200	7230592	P288-05	DF-503	PTE4S5		2TM-S5	Screen Bypass
C10	10	500	7234242	1468-00001	D6-100	5W5Q1	GP1K-100	MS-41	IF Coupling
C11A	200		♦1219563	SI200	PC-51♦	5W5T2	GP2K-201	5GA-T2	Diode RF Filter
B	200			SI200		5W5T2	GP2K-201	5GA-T2	Diode RF Filter
C12	.01	200	7237959	P288-01	D6-103	PTE4S1	GP2-333-103	2TM-S1	Audio Coupling
C13	500	500	7238879	1468-0005	D6-501	5W5T5	GP2K-501	1FM-35	AF Anp. Plate
C14	.05	200	7230592	P288-05	DF-503	PTE4S5		2TM-S5	Tone Comp.
C15	.01	100	7237959	P288-01	D6-103	PTE4S1	GP2-333-103	2TM-S1	Tone Comp.
C16	.2	200	1217876	P488-22		GT4P2		2TM-P22	Audio Coupling
C17	.003	800	1219301	P688-003	D6-302	PTE6D3	GP2-333-302	6TM-D3	Power Output Plate
C18	.006	1600	1219591	P1688-006		PTE16D6		MB-D6	Buffer Cap.
C19	500	500	7238879	1468-0005	D6-501	5W5T5	GP2K-501	1FM-35	Hash Filter

♦ Items C11A, C11B, R9 are combined in one unit.

CONTROLS

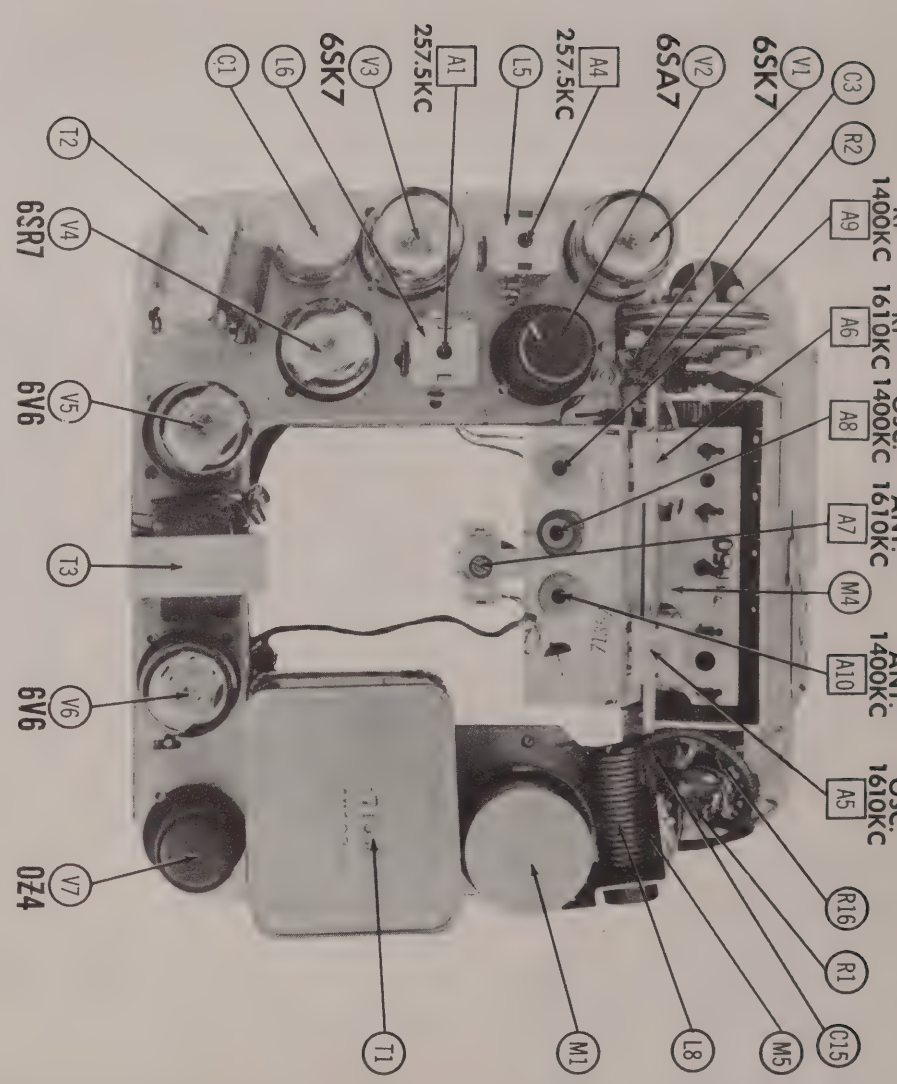
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: OLDSMOBILE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	35KΩ	½	1219582				Tone Control - Panel
B	250KΩ	½					Volume Control & SW - Rear
							Tapped @ 70KΩ

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: OLDSMOBILE PART No.	IRC PART No.	IDENTIFICATION CODES
R2	2.2Meg	½	1214563	BTS-2.2Meg	AVC Network
R3	22KΩ	½	1214550	BTS-22K	RF Amp. Plate
R4	1 Meg	½	1213282	BTS-1Meg	AVC Network
R5	22K	½	1214550	BTS-22K	Osc. Grid
R6	4.7Meg	½	1214566	BTS-4.7Meg	AVC Network
R7	18KΩ	2	7239157	BT-2-18K	Screen Dropping
R8	180Ω	½	1215559	BTS-180	IF Amp. Cathode
R9	47KΩ	½	♦1219563	BTS-47K	Diode Filter
R10	1.5Meg	½	1213283	BTS-1.5Meg	Diode Load
R11	1000Ω	½	1213235	BTS-1000	AF Amp. Cathode
R12	1000Ω	½	1213235	BTS-1000	AF Amp. Cathode
R13	1Meg	½	1213282	BTS-1Meg	AF Amp. Grid
R14	1Meg	½	1213282	BTS-1Meg	Diode Load
R15	1Meg	½	1213282	BTS-1Meg	AVC Network
R16	27KΩ	½	1214551	BTS-27K	Tone Compensation
R17	27KΩ	½	1214551	BTS-27K	AF Amp. Plate
R18	330Ω	1	7233773	BTB-330	Output Cathode
R19	1800Ω	2	1214573	BW-2-1800	Filter
R20	150Ω	1	1211005	BTB-150	Hash Suppression

♦ Items R9, C11A and C11B are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	OLDSMOBILE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	6.3VDC @ 4.7ADC	540VCT .070ADC			1219316	P-6473 ①	P-4079	VT-4 ①

① Drill new mounting holes.

TRANSFORMER (AUDIO)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	INDUCTANCE		DC RES.		OLDSMOBILE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	80Hy. C.T.		2.7KΩ C.T.		1219315				

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		OLDSMOBILE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T3	6.5KΩ C.T.	3.7Ω	600Ω C.T.	.5Ω	1219314	A-3850	A-2900		

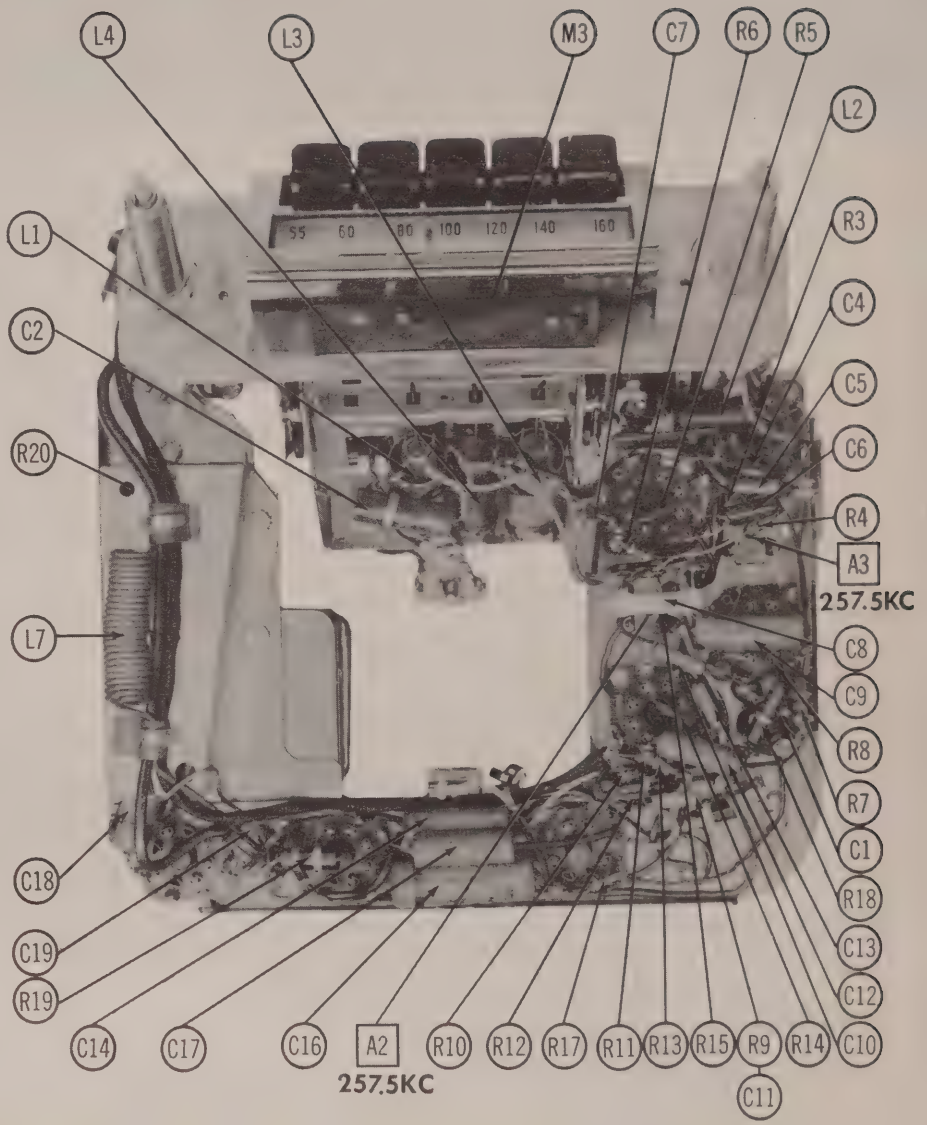
SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	OLDSMOBILE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	P.M.	3.7Ω	1219291	ST-810 Mod. P69-V	69A2	
	CONE DIA.	V. C. DIA.				
SP2	6 1/4 in. x 9 1/8 in.	1 in.				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	OLDSMOBILE PART No.	MERIT PART No.	
L1	Ant. Coil	10Ω				
L2	Ant. Choke	5Ω		1214382		
L3	RF Coil	10Ω				
L4	Osc. Coil	.2Ω	4.5Ω			
L5	Input IF	42Ω	42Ω	1219583		
L6	Output IF	45Ω	45Ω	1219584		
L7	Fil. Choke	.1Ω		1217996		
L8	Hash Choke	0Ω				

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA			INSTALLATION NOTES
				OLDSMOBILE PART No.	CORNELL-DUBILIER PART No.	RADIART PART No.	
M1	Interrupter	6.3V	115∿	1218006	5301	5301	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			OLDSMOBILE¶ PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M2	3AG	15Amp	120151		311015	157020	

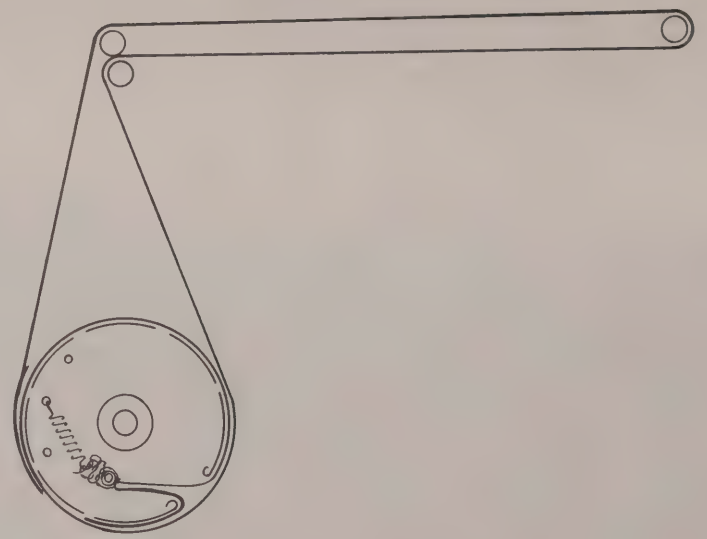
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					OLDSMOBILE PART No.		
M3	Bayonet	6-8	.25	Blue	187189		Type No. 44

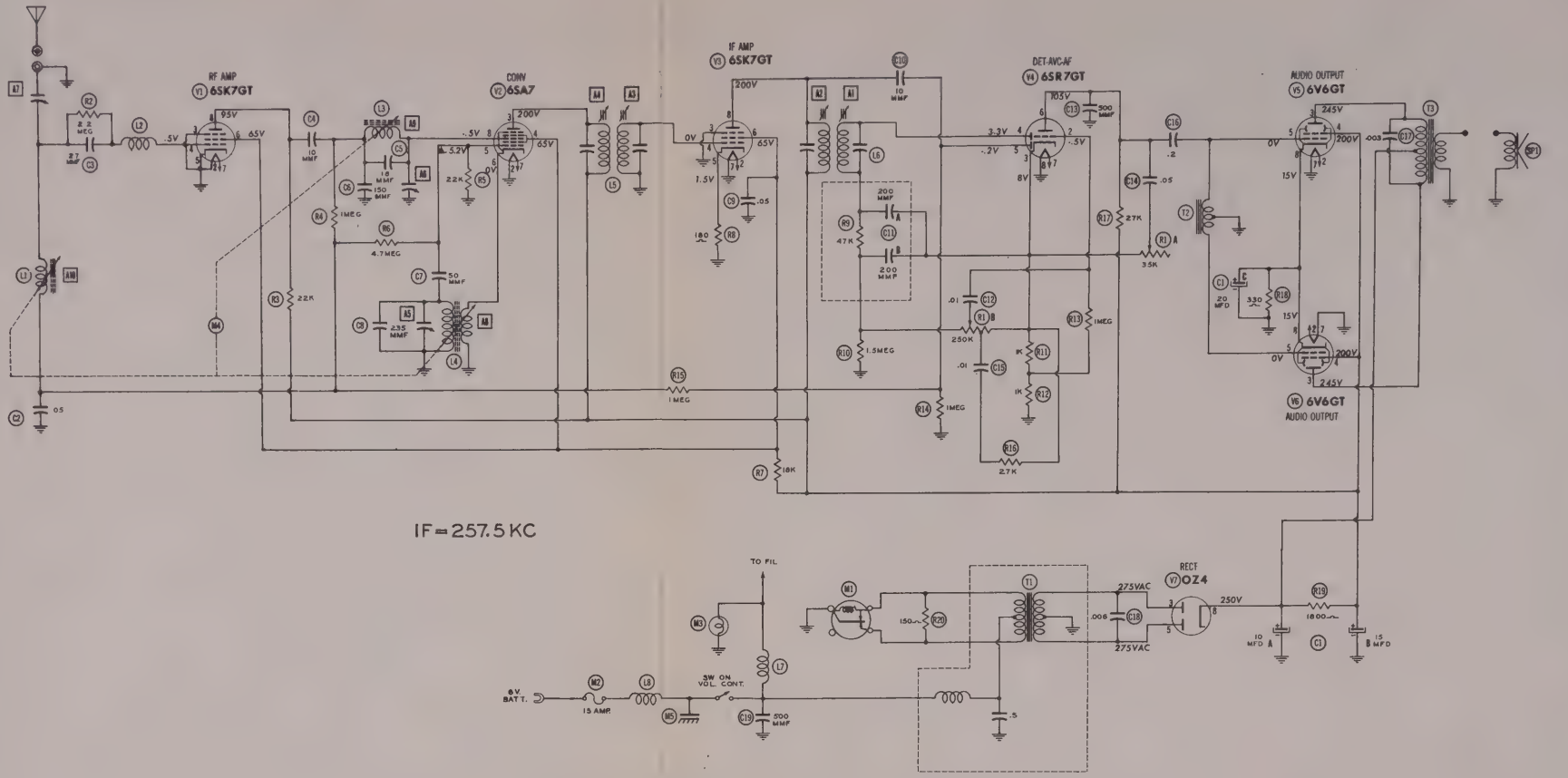
MISCELLANEOUS

ITEM No.	PART NAME	OLDSMOBILE PART No.	NOTES
M4	Tuner Unit	1219309	
M5	Spark Plate	1219310	Complete Assembly
	Dial Glass	1219588	
	Pointer	1218030	Includes Slide Assembly
	Knob	7259663	Tuning, Vol.Cont.
	Knob	7258813	Tone, Dummy

TUNING GANG FULLY CLOSED



DIAL CORD DRIVE



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SK7GT	0Ω	0Ω	0Ω	4.3Meg	∞	†19KΩ	.4Ω	†24KΩ
V 2	6SA7	0Ω	0Ω	†1.8KΩ	†18KΩ	22Ω	.3Ω	.4Ω	3Meg
V 3	6SK7GT	0Ω	.4Ω	0Ω	65Ω	180Ω	†19KΩ	0Ω	†1.8KΩ
V 4	6SR7GT	0Ω	1Meg	2KΩ	330KΩ	1Meg	†29KΩ	.4Ω	0Ω
V 5	6V6GT	0Ω	.4Ω	†300Ω	†1.8KΩ	1.2KΩ	†29KΩ	0Ω	330Ω
V 6	6V6GT	0Ω	.4Ω	†300Ω	†1.8KΩ	1.8KΩ	2.4KΩ	0Ω	330Ω
V 7	0Z4	0Ω	INF	210Ω	INF	325Ω	INF	0Ω	300KΩ

†MEASURED FROM PINS OF V1
▲ TAKEN WITH VACUUM TUBE VOLTMETER

1- DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2- Socket connections are shown as bottom views.
3- Measured values are from socket pin to common negative.
4- Battery voltage maintained at 6.3 volts for voltage readings
5- Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6- Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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PHOTOFACT* Folder

RCA
MODELS 21T176, 21T177, 21T178, 21T179

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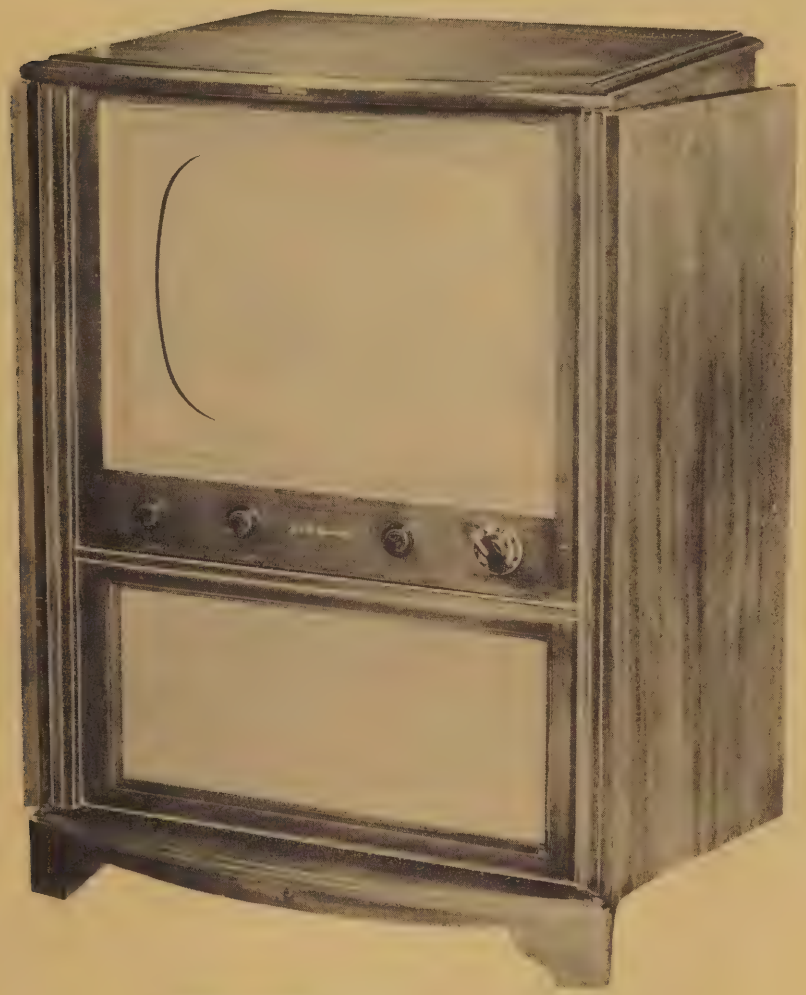

MODEL 21T178

RCA
MODELS 21T176, 21T177, 21T178, 21T179

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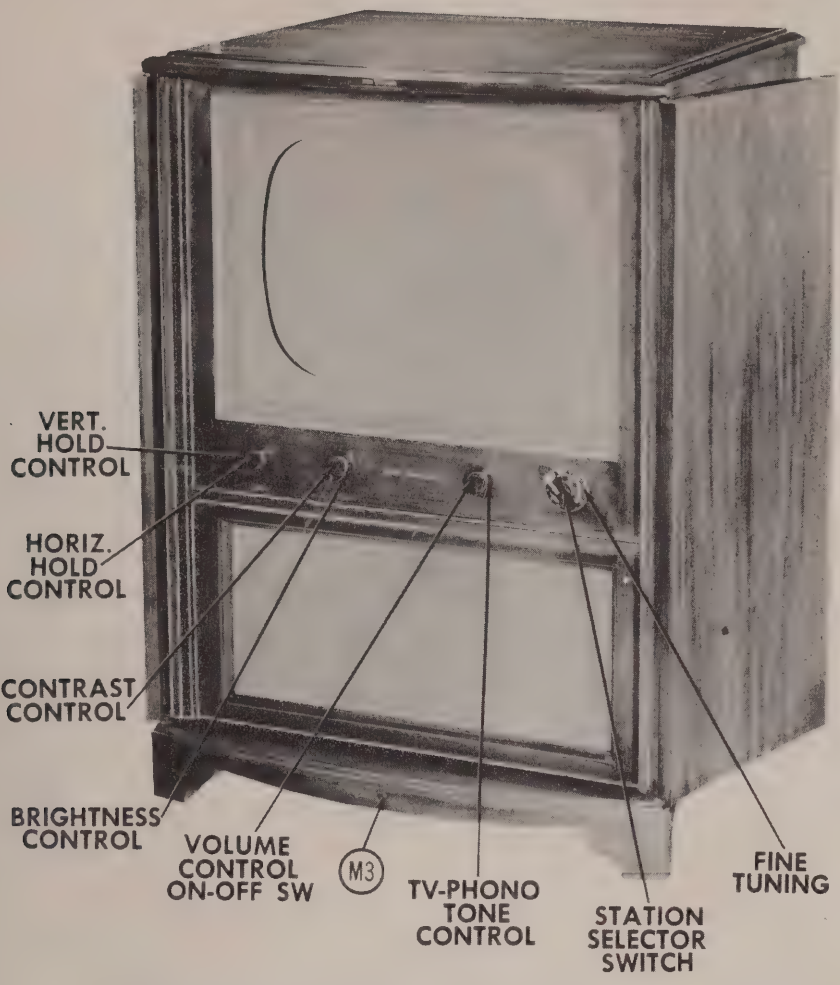
DATE 1-52 · SET 157 · FOLDER 8



RCA Victor 21T178

TRADE NAME	RCA Victor Models 21T176, 21T177, 21T178, 21T179, (Chassis KCS68C, CE)
MANUFACTURER	RCA Victor Div., Radio Corp. of America, Camden, N. J.
TYPE SET	Television Receiver
TUBES	Twenty Five
POWER SUPPLY	110-120 Volts AC - 60 Cycle — RATING 2.7 Amp.
TUNING RANGE—	Channels 2 thru 13

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RCA
MODELS 21T176, 21T177, 21T178, 21T179

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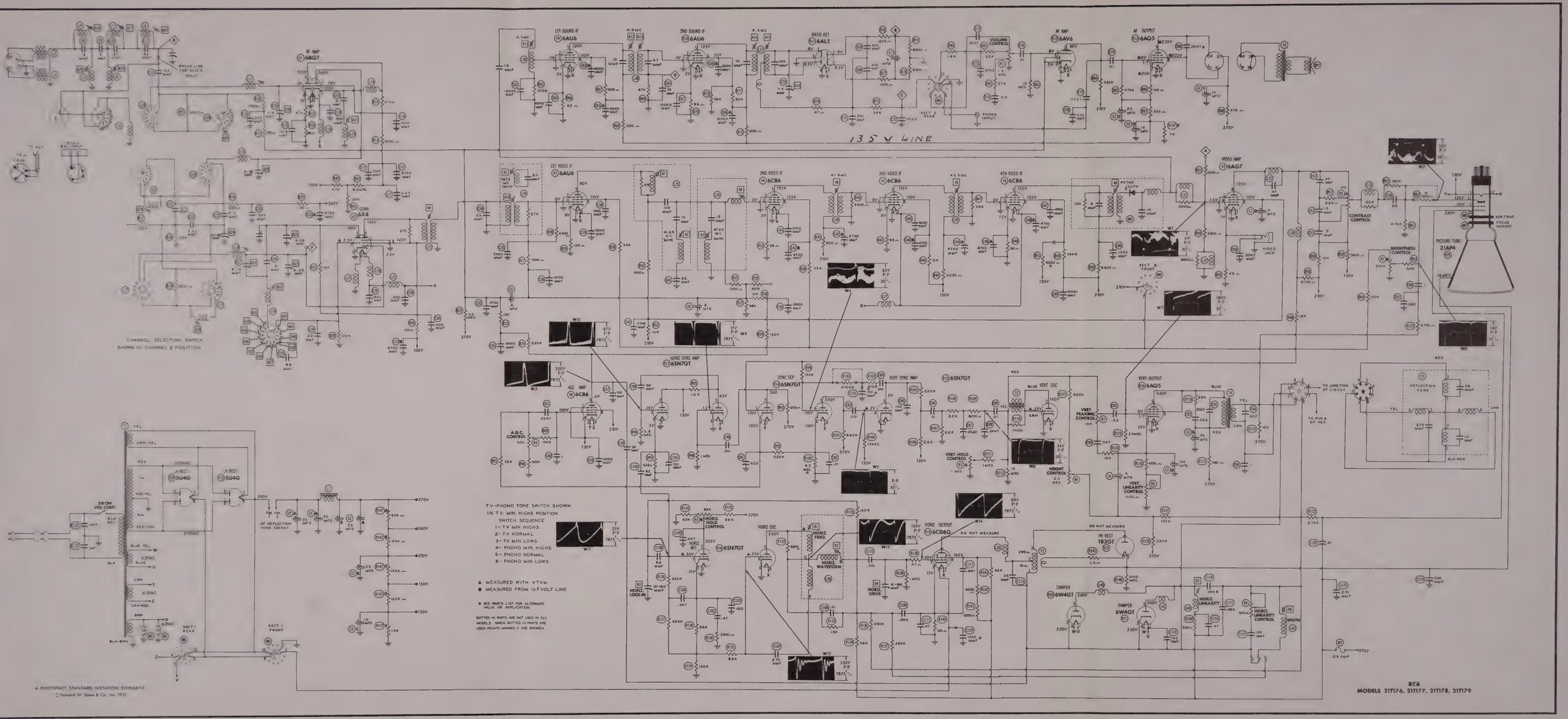

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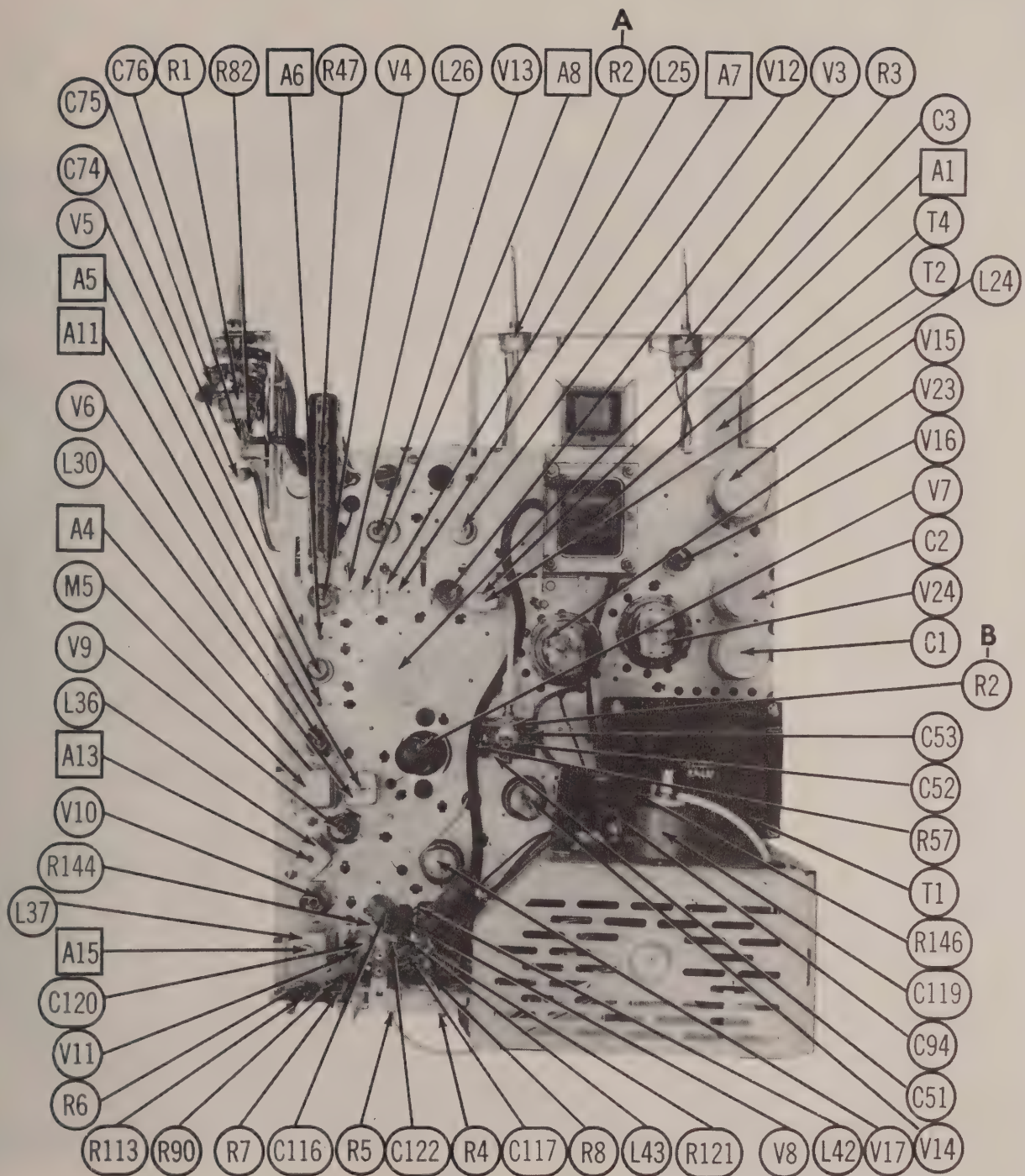
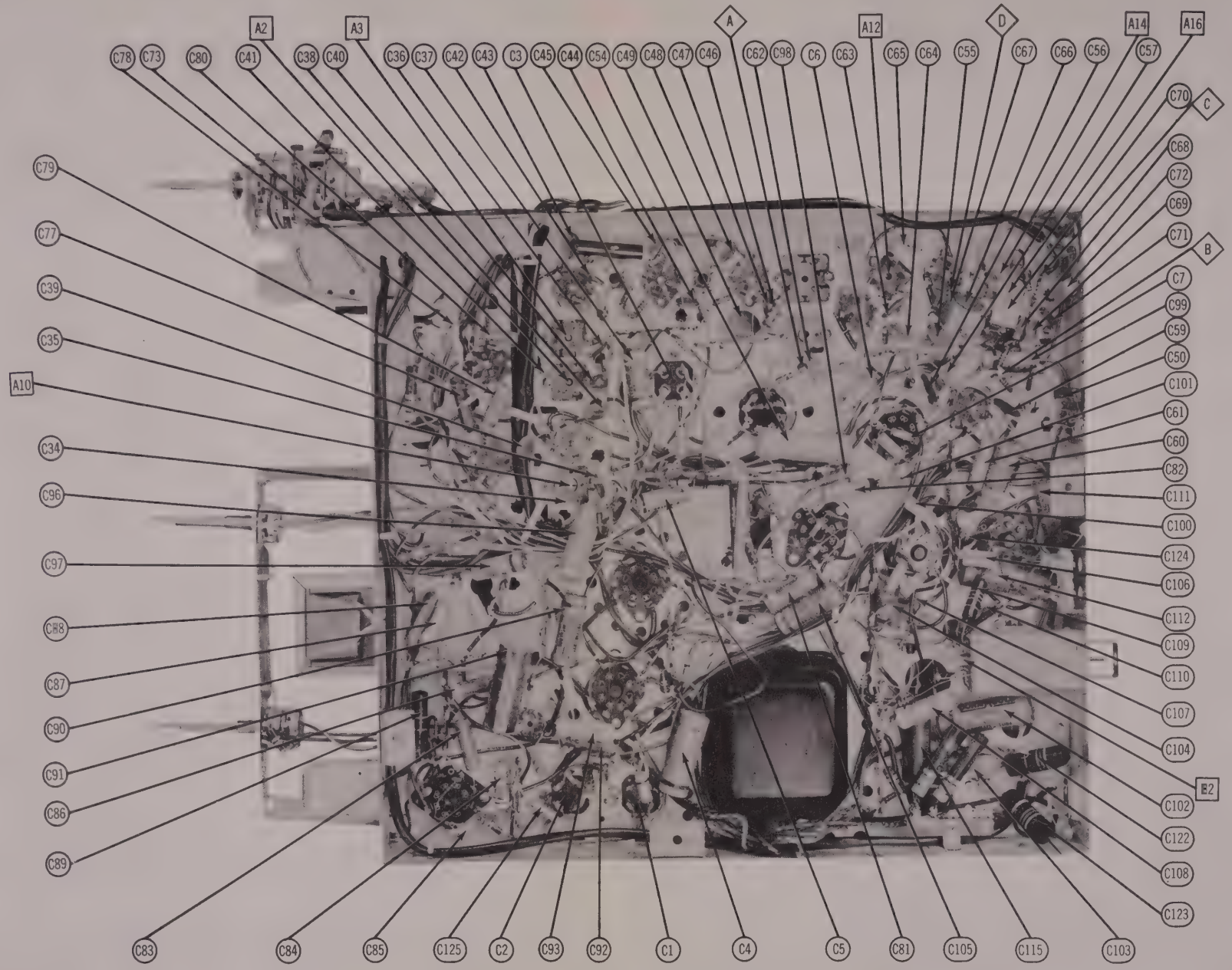
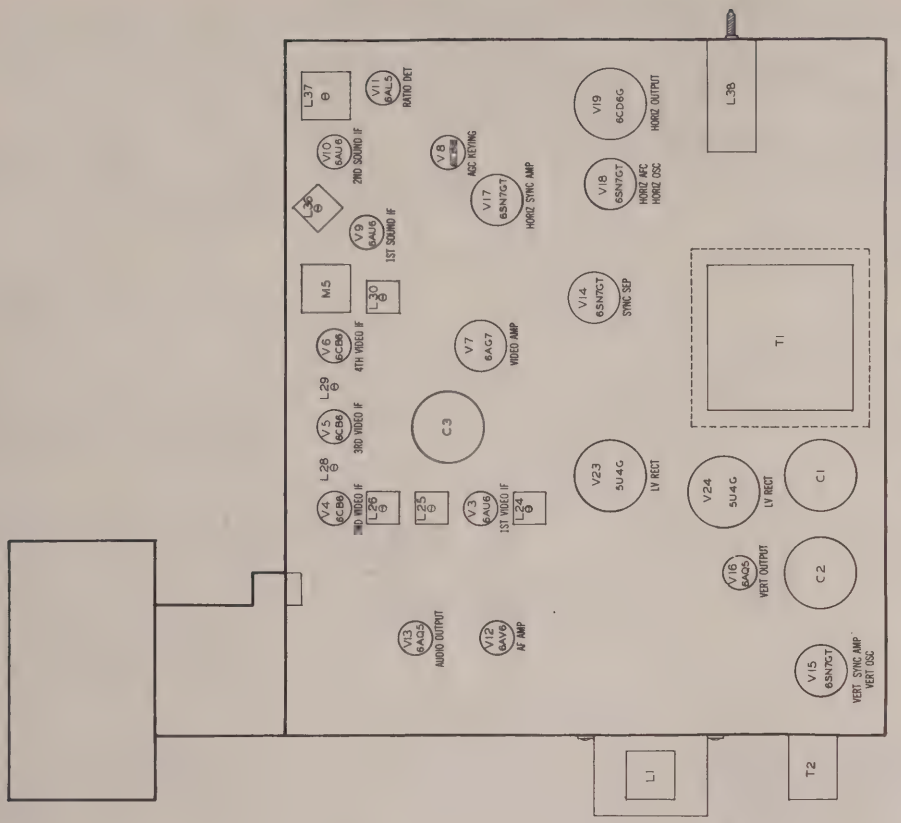
RCA
MODELS 211176, 211177, 211178, 211179



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube, (V18), from its socket.

VIDEO IF ALIGNMENT

Connect the ends of a 1000Ω potentiometer across a 7.5 Volt battery capable of withstanding considerable current drain. Connect the positive end of the battery to chassis. Connect the center arm of the potentiometer to the junction of R95 & R96.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to terminal "A" of L24. Low side to chassis.	Not Used	39.75MC	4	Use VTVM DC probe to point (A). Common to chassis.	A1	Set bias pot. to -1Volt. Adjust for MINIMUM deflection. Attenuate signal gen. to maintain -1Volt reading.
2.	"	"	"	41.25MC	"	"	A2	"
3.	"	"	"	47.25MC	"	"	A3	"
4.	"	"	"	43.7MC	"	"	A4	Adjust for maximum deflection. Attenuate signal gen. to maintain 1 volt reading.
5.	"	"	"	45.5MC	"	"	A5	"
6.	"	"	"	41.8MC	"	"	A6	"
7.	.005MFD	High side to pin 1 (grid) of 6AU6, (V3). Low side to chassis.	44MC (10MC Swp)	43.25MC 45MC 45.75MC 46.5MC	Any channel which causes no interference.	Vert. Amp. to point (A) Low side to chassis.	A7, A8	Connect 330Ω resistor across R37, R38 and terminals "A" and "F" of M5 Adjust for response curve similar to fig. 1. Attenuate sweep gen. to maintain .5 volt peak to peak response.
8.	Direct	High side to point F. Low side to chassis.	"	43.25MC 44.5MC	"	Vert. Amp. thru detector probe, (fig.2) to pin 5 of 6AU6 (V3). Low side to chassis.	A9, A10	Leave 330Ω resistors connected. Connect a 180Ω resistorbetween pin 5 of V3 and junction of R31 and C40. Adjust for response similar to fig. 3.
9.	"	"	"	42.25MC 45MC 45.75MC	"	Vert. Amp. to point (A) Low side to chassis.		Remove all damping resistors. Set IF bias to -6 volts. Check for response curve similar to fig. 4. If necessary retouch A4 and A5 for proper response. Retouch A6 only if absolutely necessary. Incorrect adjustment of A6 will interfere with trap action.

SOUND IF ALIGNMENT

Connect the oscilloscope across the speaker voice coil to use as an output indicator.
Turn the trimmer A16 for minimum capacity.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.005MFD	High side to pin 1 (grid) of 6AU6, (V10). Low side to chassis.	4.5MC (400% AM mod)	Any	DC probe to point (B). Common to chassis.	A14	Adjust for maximum deflection on VTVM. Adjust signal gen. to obtain 10 volt reading.
11.	"	"	"	"	"	A15	Adjust for MINIMUM 400% indication on scope. Repeat steps 10 and 11.
12.	"	"	"	"	DC probe to point (C). Common to chassis.	A16	Check the voltage at point (C). If the voltage exceeds ± 1.5 volts, adjust A16 for zero voltage on VTVM between positive and negative peaks. Repeat adjustment of A15 and A16 until VTVM reads less than ± 1.5 volts with A15 adjusted for MINIMUM 400% indication on scope.
13.	"	High side to point A. Low side to chassis.	4.5MC (1MC Swp)	"	USE SCOPE Vert. Amp. thru 10KΩ to point (D). Low side to chassis.	A17, A18 A19	Adjust for maximum amplitude and symmetry as per Fig. 5.

ANTENNA MATCHING UNIT ALIGNMENT

This unit has been properly aligned at the factory and is very stable. Alignment should not be attempted unless it has been definitely established that it is out of alignment and proper equipment is available to align it. The required equipment consists of a sweep generator capable of at least 1 volt output, and an oscilloscope with a sensitivity of at least .02 Volts per inch. Misalignment of this unit can cause serious attenuation of the signal especially on channel 2. Adjustment of the FM trap, (A43), however will not effect the alignment.
In the event of replacement of the antenna matching unit, the entire tuner should be realigned.
Disconnect the FM trap, L8, from the channel selector switch. The free end of L8 is alignment Point (D), as shown on the schematic.

14.	See Fig.5	Across antenna terminals	Not used	45.75MC (400% AM Mod.)	Any	Vert. amp. thru detector probe to Point (E). Low side to chassis.	A17	Adjust for MINIMUM 400% indication or scope.
15.	"	"	"	41.25MC (400% mod.)	"	"	A18	Adjust for MINIMUM 400% indication or scope.
16.	"	"	50MC (10MC swp.)	50MC 52MC 53MC	"	"	A19, A20	Connect a 300Ω resistor from Point (D) to chassis. Adjust for response curve similar to Fig. 7. A19 controls the placement of the shoulder. A20 is adjusted to give maximum amplitude of .53MC marker consistant with curve shape shown in Fig. 7. Repeat steps 14, 15 & 16 until no further improvement can be made.

FIG. 1

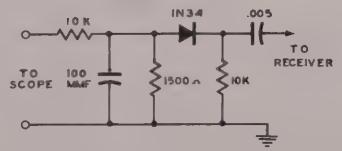


FIG. 2

FIG. 3

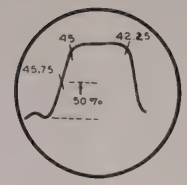


FIG. 4

FIG. 5

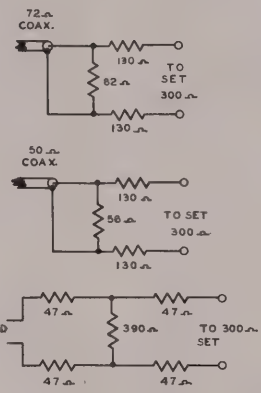


FIG. 6

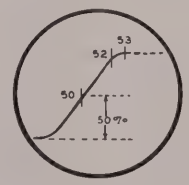


FIG. 7

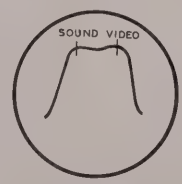


FIG. 8

ALIGNMENT INSTRUCTIONS (CONT.)

RF ALIGNMENT

If the tuner is operating and requires only touch up alignment the following pre-setting adjustments should not be performed. If the tuner is to be completely realigned pre-set all adjustments to the approximate center of their range with the following exceptions.
Pre-set A26 so the screw head is approximately 3/8 inch above the chassis. Turn A9 fully counter-clockwise. Set A23 one quarter turn from tight.
Do not change any adjustments on the antenna matching unit.
Disconnect the coax link from terminal "A" of L24. Connect a 39Ω carbon resistor across the open end of the link..
Connect a clip lead from the tuner AGC terminal, (terminal 3) to chassis.
During step 17 the signal generator is connected to the RF Amp. grid by means of a piece of small diameter wire slipped over Pin 7 of the tube, and the tube replaced in its socket. Connect the generator to the free end of the wire.
Set the fine tuning control 30 degrees clockwise from the mechanical center of its range.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
17.	1500MMF	High side to pin 7, (grid) of 6BQ7, (V1). Low side to chassis.	Not used	43.5MC (400% mod)	2	Vert. Amp. to point (F). Low side to chassis.	A21	Adjust for MINIMUM 400% indication on scope. Remove the wire from pin 7 of V1.
18.	See fig.8	Across antenna terminal	Not used	227MC (unmod)	8	Vert. Amp. thru detector probe to terminal 2 on tuner terminal strip.	A22	Adjust for zero beat indication on scope.
19.	"	"	183MC (10MC Swp)	181.25MC 185.75MC	"	Vert. Amp. to point (F) Low side to chassis.	A23, A24 A25, A26	Adjust for response curve similar to fig. 8.
20.	"	"	Not used	129MC	6	Vert. Amp. thru detector probe to terminal 2 of tuner terminal strip.	A27	Adjust for zero beat indication on scope.
21.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	"	Vert. Amp. to point (F) Low side to chassis.	A28, A29 A30	Adjust for response curve similar to fig. 8.
22.	"	"	Not used	Not used	"	USE VTVM DC probe to point (E). Common to chassis.	A31	If 3.5 volt reading cannot be obtained adjust for maximum voltage which should exceed -2.5 volts.
23.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	"	Vert. Amp. to point (F) Low side to chassis.		Check for response curve similar to fig. 8. If necessary retouch A28, A29 and A30 for proper response.
24.	Repeat step 18.							
25.	Repeat step 19.							
26.	Repeat step 23, If necessary repeat steps 16, 17, and 20 until no further adjustments are required.							
27.	See Fig.8	Across antenna terminal.	Not used	257MC	13	Vert. amp. thru detector probe to terminal 2 of tuner terminal strip. Low side to chassis.	A32	Adjust for zero beat indication on scope, then overshoot the adjustment by turning the screw in the same direction, a little further than necessary to obtain zero beat. Adjust A22 to reset oscillator to proper frequency.
28.	"	"	213MC (10MC swp.) 207MC (10MC swp.) 201MC (10MC swp.) 195MC (10MC swp.) 189MC (10MC swp.) 183MC (10MC swp.) 177MC (10MC swp.)	211.25MC 215.75MC 205.25MC 209.75MC 199.25MC 203.75MC 193.25MC 197.75MC 187.25MC 191.75MC 181.25MC 185.75MC 175.25MC 179.75MC	13 12 11 10 9 8 7	Vert. amp. to Point (F). Low side to chassis.		Check all high band channels for response curve similar to Fig. 8. If markers fall below 80% on any channel, switch to channel 8 and retouch A23, A24, A25 and A26(see step 17) Check the channel 8 oscillator frequency, (step 16). If necessary overshoot the adjustment of A22 and correct it by adjusting A32.
29.	Repeat Step 20							
30.	Repeat Step 19							
31.	See Fig.8	Across antenna terminal.	85MC (10MC swp.) 79MC (10MC swp.) 69MC (10MC swp.) 63MC (10MC swp.) 57MC (10MC swp.)	83.25MC 87.75MC 77.25MC 81.75MC 67.25MC 71.75MC 61.25MC 65.75MC 55.25MC 59.75MC	6 5 4 3 2	Vert. Amp. to Point (F). Low side to chassis.		Check the response curve shape on all low channels. Also check the oscillator injection voltage at Point (F), which should be between -2.5 and -5.5 volts. If channels2, 3 and 4 show a similar tilt, overshoot the adjustment of A25 on channel 2 and correct it by adjusting A30 on Channel 6 for maximum amplitude between the markers. Also recheck channels 7 thru 13.
32.	See Fig.8	Across antenna terminal.	Not used	257MC	13	Vert. amp. thru detector probe to terminal 2 on tuner term. strip. Low side to chassis.		Check the channel 13 oscillator frequency, if necessary adjust A22 to correct it.
33.	"	"	"	251MC 245MC 239MC 233MC 227MC 221MC 129MC 123MC 113MC 107MC 101MC	12 11 10 9 8 7 6 5 4 3 2	"	A33 A34 A35 A36 A37 A38 A27 A39 A40 A41 A42	Adjust for zero beat indication on scope. It should be possible to obtain zero beat on all channels with the fine tuning control 30 deg. clockwise of mechanical center.
	Remove 39Ω Resistor and reconnect link from tuner. Recheck step 9 of Video IF Alignment and readjust A9.							

FM TRAP ADJUSTMENT

If interference from an FM station is encountered adjust the FM trap A43 to eliminate or minimize the interference. If channels 5 or 6 are active in the area, they should be checked to make sure the trap is not interfering with them.

RCA
MODELS 21T176, 21T177, 21T178, 21T179

RESISTANCE MEASUREMENTS

RESISTANCE READINGS

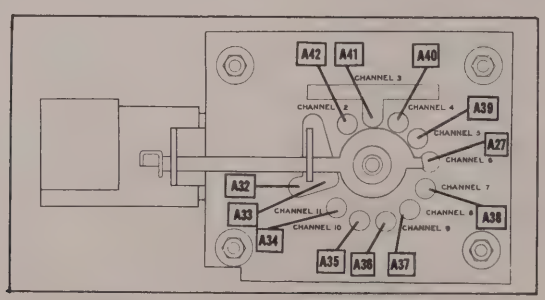
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7	†2KΩ	8.2Meg	8.8Meg	0Ω	.1Ω	8.7Meg	170KΩ	130Ω	0Ω
V 2	6X8	0Ω	100KΩ	†13KΩ	.1Ω	.2Ω	0Ω	100KΩ	†2.9KΩ	†2.9KΩ
V 3	6AU6	57KΩ	0Ω	0Ω	.1Ω	†11KΩ	†34KΩ	100Ω		
V 4	6CB6	57KΩ	56Ω	0Ω	.1Ω	†2.3KΩ	†34KΩ	0Ω		
V 5	6CB6	.3Ω	68Ω	.1Ω	0Ω	†5KΩ	†13KΩ	0Ω		
V 6	6CB6	.3Ω	180Ω	.1Ω	0Ω	†8.1KΩ	†11KΩ	0Ω		
V 7	6AG7	0Ω	0Ω	0Ω	3.9KΩ	43Ω	†11KΩ	.1Ω	†8KΩ	
V 8	6CB6	290KΩ	†3.8KΩ	¶0Ω	¶.2Ω	160KΩ	†1.3KΩ	†3.8KΩ		
V 9	6AU6	470KΩ	0Ω	0Ω	.1Ω	■1KΩ	■2KΩ	82Ω		
V 10	6AU6	47KΩ	0Ω	0Ω	.1Ω	■1KΩ	■24KΩ	68Ω		
V 11	6AL5	7.8KΩ	8KΩ	.1Ω	0Ω	Inf.	0Ω	Inf.		
V 12	6AV6	10Meg	0Ω	0Ω	.1Ω	170KΩ	170KΩ	†330KΩ		
V 13	6AQ5	■470KΩ	■430Ω	0Ω	.1Ω	†880Ω	†510Ω	■470KΩ		
V 14	6SN7GT	†26KΩ	†1.2KΩ	180KΩ	†175KΩ	†680KΩ	400KΩ	¶0Ω	¶.2Ω	
V 15	6SN7GT	1.5Meg	†1.8Meg	0Ω	†1.5Meg	†250KΩ	0Ω	0Ω	.1Ω	
V 16	6AQ5	3.3Meg	1.3KΩ	0Ω	.1Ω	†1.2KΩ	†1.2KΩ	3.3Meg		
V 17	6SN7GT	3.9Meg	†3.8KΩ	820Ω	1Meg	†15KΩ	0Ω	0Ω	.1Ω	
V 18	6SN7GT	1.3Meg	†50KΩ	218KΩ	218KΩ	†56KΩ	0Ω	0Ω	.1Ω	
V 19	6CD6G	Inf.	.1Ω	100Ω	Inf.	1Meg	100Ω	0Ω	†12KΩ	TOP CAP #12Ω
V 20	6W4GT	Inf.	Inf.	200KΩ	Inf.	†240Ω	Inf.	♦.1Ω	♦0Ω	
V 21	6W4GT	Inf.	200KΩ	200KΩ	Inf.	†240Ω	Inf.	♦.1Ω	♦0Ω	
V 22	1B3GT	PINS 1 THROUGH 8 HAVE INF RESISTANCE								TOP CAP #300Ω
V 23	5U4G	Inf.	11KΩ	Inf.	17Ω	Inf.	16Ω	Inf	11KΩ	
V 24	5U4G	Inf.	11KΩ	Inf.	17Ω	Inf.	16Ω	Inf.	11KΩ	
V 25	21AP4	¶0Ω	PIN 2 200KΩ	PIN 10 #270KΩ	PIN 11 120KΩ	PIN 12 ¶.2Ω				

ALL MEASUREMENTS TAKEN IN TV POSITION
ALL CONTROLS SET FOR NORMAL OPERATION
† MEASURED FROM PIN 8 OF V23 & V24
¶ MEASURED FROM 130VDC LINE
♦ MEASURED FROM PIN 8 OF V21
■ MEASURED FROM 135VDC LINE
MEASURED FROM PIN 3 OF V20 & V21

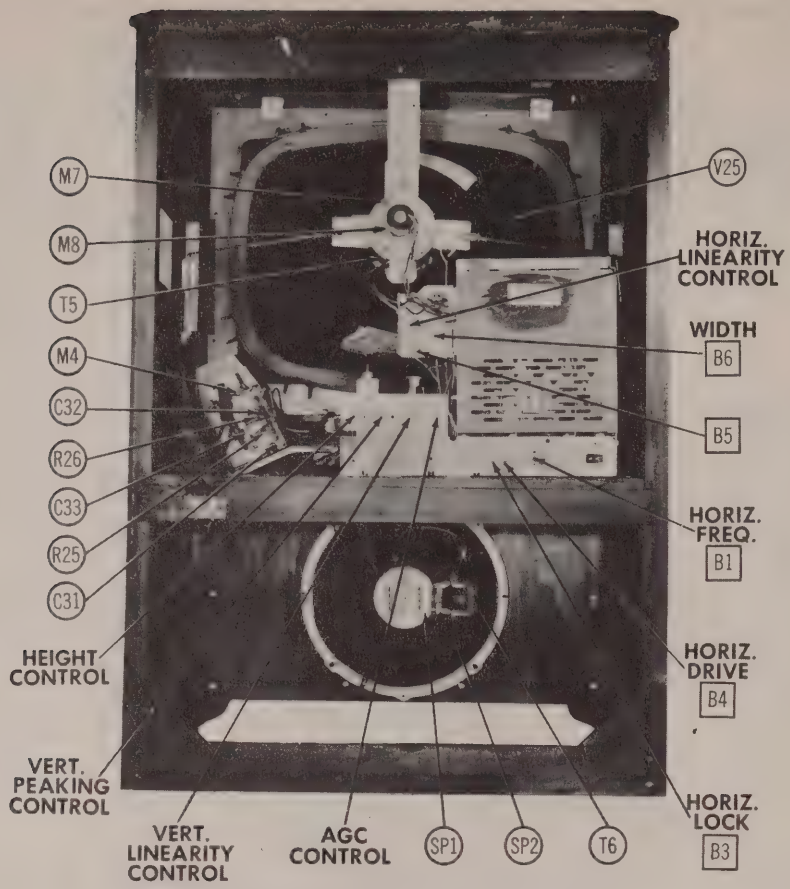
DISASSEMBLY INSTRUCTIONS

1. Remove 8 push on type control knobs.
2. Remove 3 wood screws from back cover. Remove cover.
3. Disconnect built-in antenna.
4. Disconnect speaker.
5. Remove clip on jewel light.
6. Disconnect H. V. lead.
7. Disconnect picture tube socket.
8. Disconnect yoke plug from H. V. unit.
9. Remove 6 chassis bolts. Remove chassis.
10. Remove speaker mounting nuts. Remove speaker.

Note: For picture tube removal, it is necessary to remove the chassis as outlined above.



OSCILLATOR ALIGNMENT POINTS



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.
If the picture cannot be synchronized with the horizontal hold control, turn the hold control to the center of its range and adjust the horizontal frequency slug, (B1), If adjustment of B1 will not synchronize the picture, turn the waveform slug, (B2), several turns out counter-clockwise and readjust B1.
Examine the width and horizontal linearity of the picture . If they are not approximately correct adjust the horizontal drive, width, and linearity as outlined under HORIZ. DRIVE, WIDTH, AND LINEARITY ADJUSTMENT.
Connect the low capacity probe of an oscilloscope to terminal C of L38.
Adjust the waveform slug, (B2), until the broad and narrow peaks of the waveform on the scope are of equal height as shown in figure 9. If necessary during adjustment of B2, readjust B1 to keep the picture synchronized.
Turn the horizontal hold control to fully counter-clockwise, and momentarily interrupt the signal by switching to another channel and back again.
If the picture is not out of synchronization turn B1 slightly and repeat the signal interruption until the picture is out of synchronization and shows several bars sloping downward to the left.
Slowly turn the hold control clockwise and carefully note the least number of sloping bars present before the picture pulls into synchronization.
If more than 3 bars are present adjust the locking range trimmer, (B3), slightly clockwise , if less than 2 bars are present adjust B3 slightly counter-clockwise.
Repeat the check and adjustment of B3 until 2 to 3 bars are present at the pull-in point.
Turn the horizontal hold control to fully clockwise .
Adjust B1 until one bar, sloping downward to the right, appears in the picture. Then back off until the bar just moves off the picture leaving the picture in synchronization.

HORIZONTAL DRIVE, WIDTH, AND LINEARITY ADJUSTMENTS

Pre-set the adjustments as follows.
Place the width link in the minimum width position, (top).
Pre-set the width slug, (B6), to approximately mid-position.
Pre-set the horizontal linearity slug, (B5), near minimum inductance, (counter-clockwise).
Pre-set the horizontal linearity control near minimum resistance, (clockwise).
Pre-set the horizontal drive trimmer, (B4), to minimum capacity, (counter-clockwise)
Turn the set on and tune in a TV station, preferably a test pattern. Allow a few minutes for set to warm up.
If the raster is cramped or shows a bright vertical bar in the picture adjust B4 clockwise just enough to remove this condition.
Adjust B5 clockwise until the picture of best linearity and maximum deflection, or the best compromise, are obtained and then one quarter turn more.
Retouch B4 if necessary to obtain best results.
Check the horizontal linearity at various settings of the brightness control. There should be no compression of the right side of the picture, and no appreciable change in linearityespecially at the extreme left side of the picture.
If objectional changes do occur, turn B5 slightly clockwise and repeat the check.
Adjust the width slug, (B6), until the picture is slightly wider than necessary to fill the mask horizontally. In the event of low line voltage, it may be necessary to move the width link to the lower position to obtain proper width. In this position the width coil, (B6) is inoperative.
If the left side of the picture appears stretched, adjust the horizontal linearity control counter-clockwise. If the left side of the picture appears cramped turn the linearity control clockwise. Whenever possible it is desirable to correct the linearity with the linearity control rather than the drive trimmer(B4).

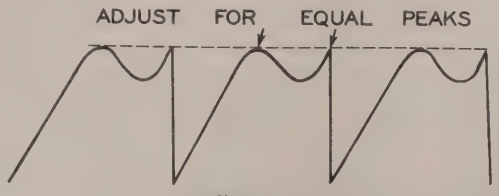
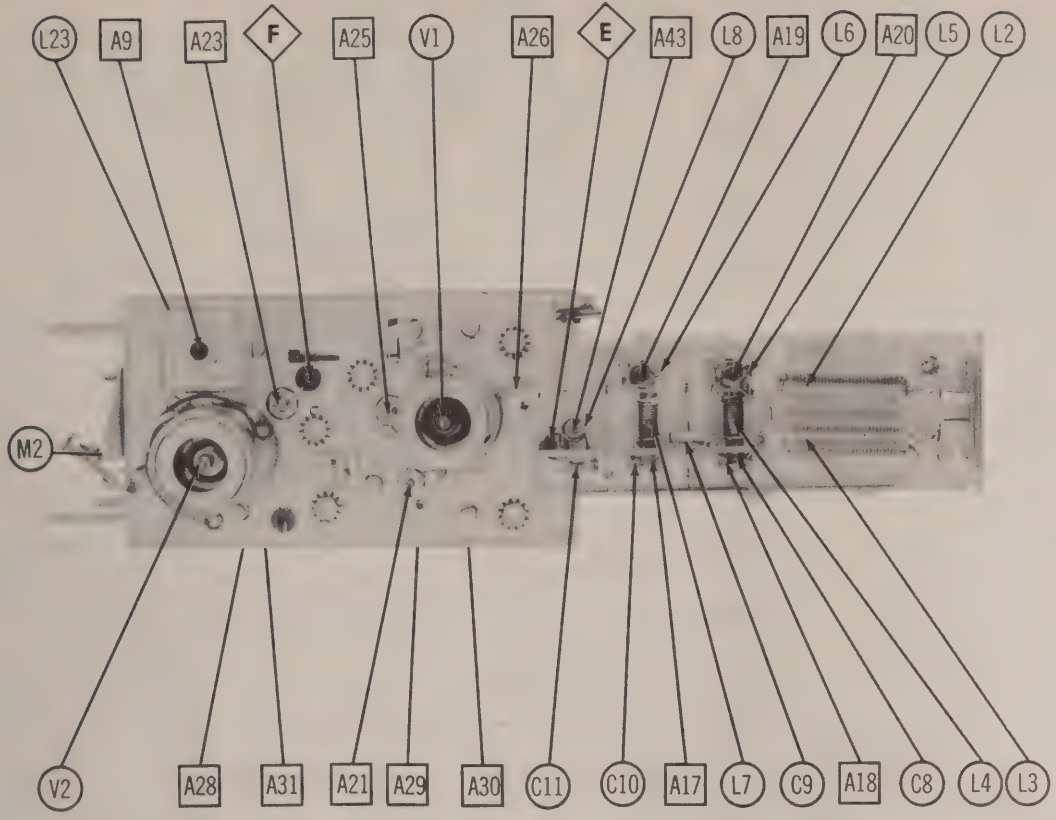
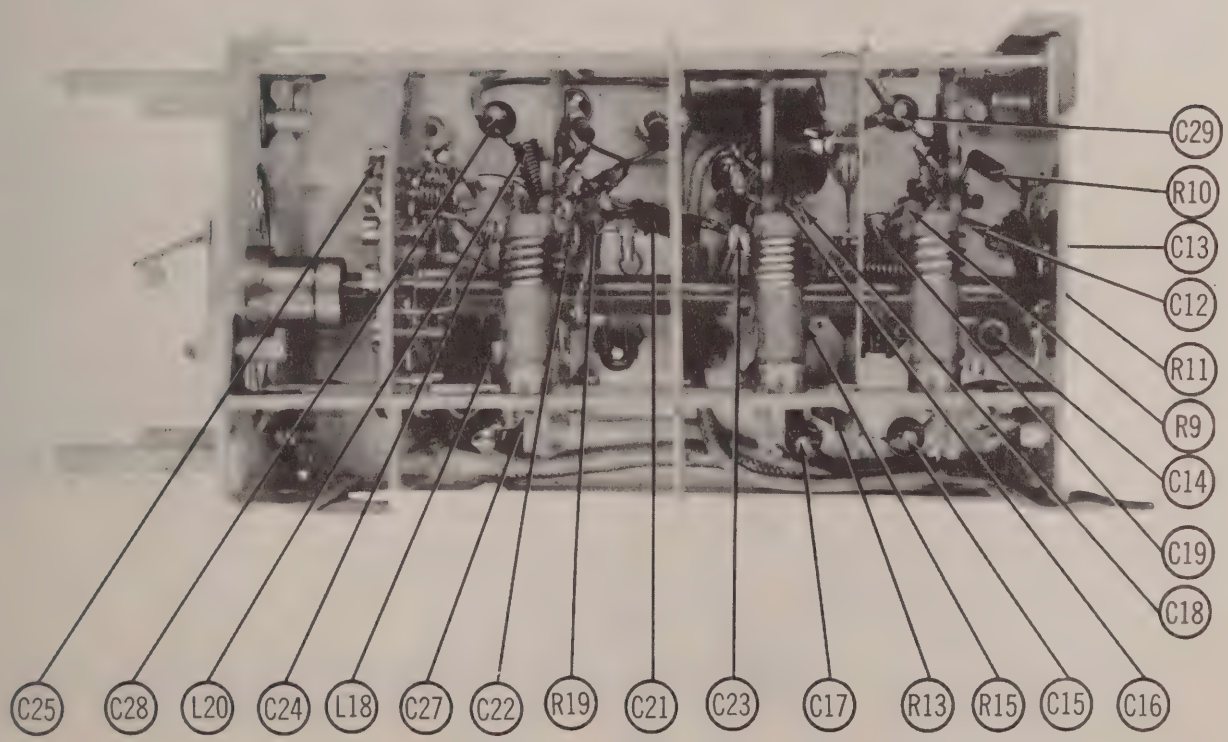


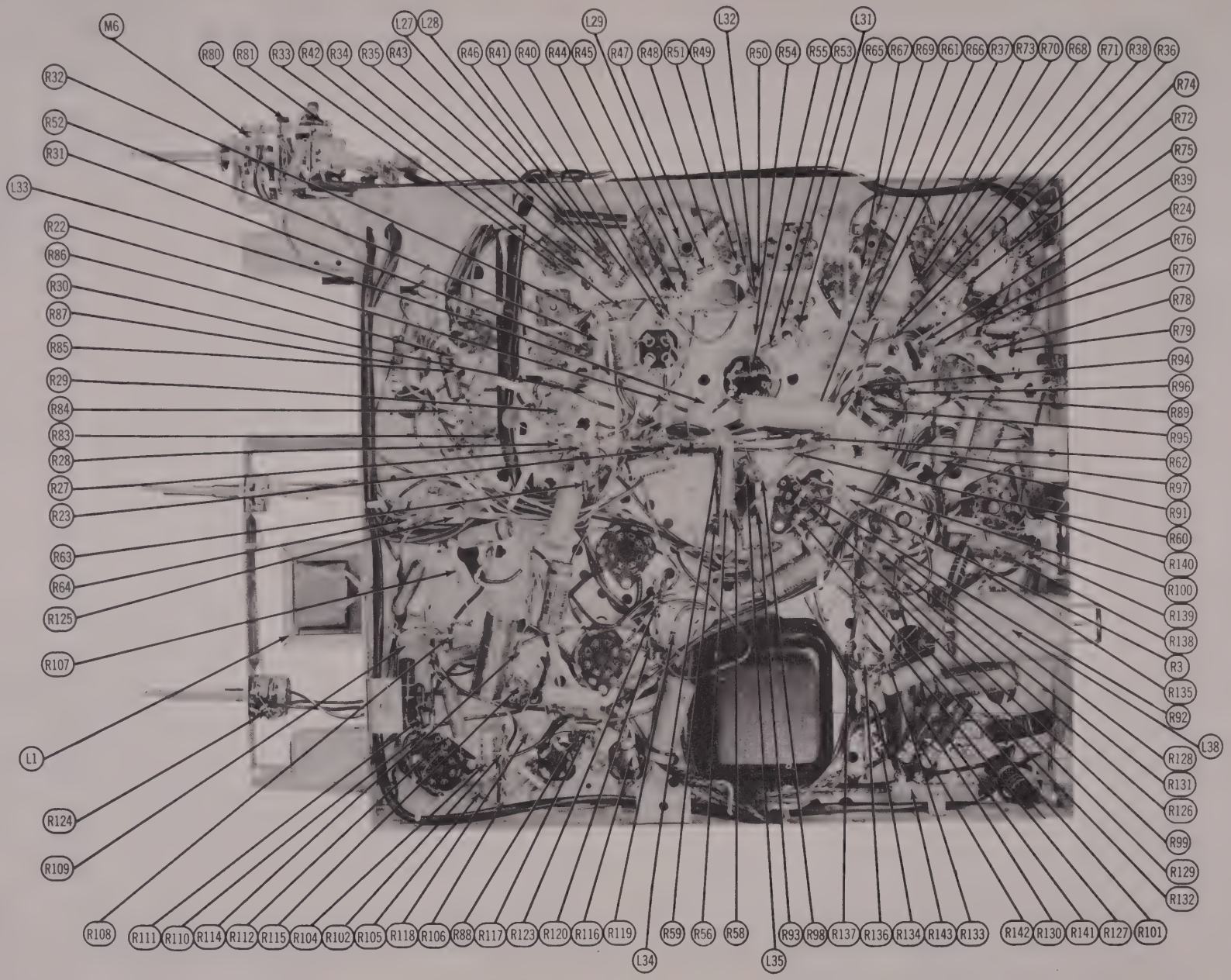
FIG. 9



RF TUNER - TOP VIEW



RF TUNER - BOTTOM VIEW



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: RCA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6BQ7	6BQ7	9AJ	
V2	Converter	6X8	6X8	9AK	
V3	1st. Video IF Amp.	6AU6	6AU6	7BK	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	4th. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Amp.	6AG7	6AG7	8Y	
V8	AGC Amp.	6CB6	6CB6	7CM	
V9	1st. Sound IF Amp.	6AU6	6AU6	7BK	
V10	2nd. Sound IF Amp.	6AU6	6AU6	7BK	
V11	Ratio Det.	6AL5	6AL5	6BT	
V12	AF Amp.	6AV6	6AV6	7BT	
V13	AF Output	6AQ5	6AQ5	7BZ	
V14	Sync. Sep.	6SN7GT	6SN7GT	8BD	
V15	Vert. Sync. Amp. Vert. Osc.	6SN7GT	6SN7GT	8BD	
V16	Vert. Output	6AQ5	6AQ5	7BZ	
V17	Horiz. Sync. Amp.	6SN7GT	6SN6GT	8BD	
V18	Horiz. AFC-Horiz. Osc.	6SN7GT	6SN7GT	8BD	
V19	Horiz. Output	6CD6G	6CD6G	5BT	
V20	Damper	6W4GT	6W4GT	4CG	
V21	Damper	6W4GT	6W4GT	4CG	
V22	H.V. Rect.	1B3GT	1B3GT	3C	
V23	L.V. Rect.	5U4G	5U4G	5T	
V24	L.V. Rect.	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: RCA PART No.	REPLACEMENT DATA: SYLVANIA PART No.	REPLACEMENT DATA: THOMAS PART No.	RTMA BASE TYPE	NOTES
V25	21AP4			12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: RCA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	35	450	76486	AFH4-82		UPT433			▰Filter
B	25	450							■Decoupling
C	20	200							▲Audio Output Cathode
D	100	50							Vert. Output Cathode
C2A	35	450	76485	AFH4-16		UPT434		TVL-3785	▰Filter
B	35	450		PRS250/4				TVA-1504	■Vert. Output Dec.
C	10	450							▲Output Dec.
D	10	200							Decoupling
C3A	35	450	75510	AFH4-16		UPT420		TVL-3785	▰Filter
B	35	450						TVA-1702	■ Filter
C	10	450							▲Decoupling
D	5	450							Video Amp. Screen
C4	5	450	28417	PRS450/4		BR445		TVA-1702	Vert. Osc. Dec.
C5	2	50	73747	PRS150/4		BBR2-50		TVA-1301	AGC Filter
C6	2	50	73747	PRS150/4		BBR2-50		TVA-1301	AGC Filter
C7	5	50	74521	PRS150/4		BR550		TVA-1303	Stabilizing Cap.
C8	18		54207		TCZ-18		NP0K-180		Fixed Trimmer
C9	5		9305L	SI5NP0	TCZ-4.7		NP0K-050		RF Coupling
C10	27		72570		TCZ-27		NP0K-270		Fixed Trimmer
C11	33		38868	SI33	D6-330		GP1K-330	5GA-Q33	Fixed Trimmer
C12	22		76557		TCZ-22		NP0K-220		RF Coupling
C13	1500		74748	BPD-0015	DD-152		801-0015	5HK-D15	AGC Filter
C14	1-4		76532		829-4				Variable Trimmer
C15	1500		75166	SI1500	D6-152		GP2L-152	501C1	RF Amp. Cathode
C16	1500		73748	BPD-0015	DD-152		801-0015	5HK-D15	RF Bypass
C17	1500		75166	SI1500	D6-152		GP2L-152	501C1	RF Bypass
C18	8		70597				NP0K-080		Fixed Trimmer
C19	1500		73748	BPD-0015	DD-152		801-0015	5HK-D15	RF Amp. Fil.
C20	1500		75166	SI1500	D6-152		GP2L-152	501C1	RF Bypass
C21	270		75199	SI270	D6-271		GP2K-271	5GA-T27	RF Coupling
C22	330		76552	SI330	D6-331		GP2K-331	5GA-T33	RF Coupling
C23	270		75199	SI270	D6-271		GP2K-271	5GA-T27	RF Coupling
C24	22		76558	SI22N080			N080-331-220		Osc. Grid. Cap.
C25	.68		71088		TCZ-.68		NP0K-R68		Fixed Trimmer
C26	12		76550				N080-331-120		Osc. Feedback
C27	.8-1.4		76545		829-3				Variable Trimmer
C28	1500		75166	SI1500	D6-152		GP2L-152	501C1	Conv. Fil.
C29	1500		75610	SI1500	D6-152		GP2L-152	501C1	Fil. Bypass
C30	1500		75610	SI1500	D6-152		GP2L-152	5HK-D15	RF Bypass
C31	4700		73473	BPD-005	DD-502	1D5D5	811-005	5HK-D47	RF Bypass
C32	4700		73473	BPD-005	DD-502	1D5D5	811-005	5HK-D47	AGC Filter
C33A	4700		76470	BPD-2X005	DD-2-502	1D5D5	811-005	5HK-2D47	RF Bypass
B	4700					1D5D5	811-005		RF Bypass
C34	27		72570	SI27	D6-270		GP1K-270		Fixed Trimmer
C35	4700		73473	BPD-005	DD-502	1D5D5	811-005	5HK-D47	AGC Filter
C36	4700		73473	BPD-005	DD-502	1D5D5	811-005	5HK-D47	AGC Filter
C37	.047	400	73553	P488-047	DF-503	PTE485		4TM-S47	RF Bypass
C38	4700		73473	BPD-005	DD-502	1D5D5	811-005	5HK-D47	1st Video IF Screen
C39	4700		73473	BPD-005	DD-502	1D5D5	811-005	5HK-D47	1st Video IF Fil.
C40	4700		73473	BPD-005	DD-502	1D5D5	811-005	5HK-D47	RF Bypass
C41	82		71514		TCN-82		N750L-820		Fixed Trimmer
C42A	4700		76470	BPD-2X005	DD-2-502	1D5D5	811-005	5HK-2D47	2nd Video IF Plate
B	4700					1D5D5	811-005		2nd Video IF Screen
C43	4700		73473	BPD-005	DD-502	1D5D5	811-005	5HK-D47	2nd Video IF Fil.
C44A	4700		76470	BPD-2X005	DD-2-502	1D5D5	811-005	5HK-2D47	3rd Video IF Plate
B	4700					1D5D5	811-005		3rd Video IF Screen
C45	4700		73473	BPD-005	DD-502	1D5D5	811-005	5HK-D47	3rd Video IF Fil.
C46	1500		75166	SI1500	D6-152	1W5D15	GP2L-152	501C1	4th Video IF Plate
C47	4700		73473	BPD-005	DD-502	1D5D5	811-005	5HK-D47	4th Video IF Screen
C48A	4700		76470	BPD-2X005	DD-2-502	1D5D5	811-005	5HK-2D47	4th Video IF Cathode
B	4700					1D5D5	811-005		4th Video IF Fil.
C49	10000		73960	BPD-01	DD-103	1D381	821-01	5HK-81	RF Bypass

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA RCA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C50	.0047	600	73920	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-S47	Video Amp. Cathode
C51	47		39042	S14TN750	TCN-47		N750K-470	5TCU-Q47	Contrast Cont. Shunt
C52	15		39044		TCN-15		N750K-150	5TCU-Q15	Contrast Cont. Shunt
C53	3		78507	S13NP0			NP0K-030		Contrast Cont. Shunt
C54	.22	400	73794	P488-22		GT4P2		4TM-P22	Video Coupling
C55	10000		73960	BPD-01	DD-103	1D3S1	821-01	5HK-S1	AGC Filter
C56	10000		73960	BPD-01	DD-103	1D3S1	821-01	5HK-S1	AGC Filter
C57	100	500	78578	1468-0001	D6-101	5W5T1	GP1K-01	1FM-31	Voltage Divider
C58	39		78574						Horiz. Feedback
C59	10000		73960	BPD-01	DD-103	1D3S1	821-01	5HK-S1	AGC Cathode
C60	.1	400	73551	P488-1	DF-104	PTE4P1		4TM-P1	AGC Filter
C61	.0047	600	73920	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	AGC Filter
C62	10000		73960	BPD-01	DD-103	1D3S1	821-01	5HK-S1	Sound IF Grid Filter
C63A	10000	}	75877	BPD-01	DD-3-103	1D3S1	821-01	5HK-S1	1st Sound IF Screen
B	10000			BPD-01	DD-103	1D3S1	821-01	5HK-S1	1st Sound IF Screen
C64	10000		73960	BPD-01	DD-103	1D3S1	821-01	5HK-S1	1st Sound IF Cathode
C65	56		71924		TCN-56		N750K-560		2nd Sound IF Grid
C66A	10000	}	75877	BPD-01	DD-103	1D3S1	821-01	5HK-S1	2nd Sound IF Plate
B	10000			BPD-01	DD-103	1D3S1	821-01	5HK-S1	2nd Sound IF Screen
C67	10000		73960	BPD-01	DD-103	1D3S1	821-01	5HK-S1	2nd Sound IF Cathode
C68	470	500	39644	1468-0005	D6-471	5W5T5	GP2K-471	1FM-35	Diode Load Cap.
C69	470	500	39644	1468-0005	D6-471	5W5T5	GP2K-471	1FM-35	Diode Load Cap.
C70	1-4		78532		829-4		532-08-0R5		Variable Trimmer
C71	330	500	78473	1468-00035	D6-331		GP2K-331	1FM-335	Diode Load Cap.
C72	.0022	600	73595	P688-0022	D6-222	PTE6D2	GP2-333-222	6TM-D22	De-emphasis
C73	.0047	600	73920	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Audio Coupling
C74	.015	200	73797	P388-015		PTE6S15		6TM-S15	Tone Comp.
C75	.0082	600	73808						Tone Comp.
C76	.01	400	73561	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C77	.0027	600	73599	P688-003	D6-272	PTE6D3	GP2-333-272	6TM-D3	Tone Comp.
C78	270		47647	S1270	D6-271	5W5T5	GP2K-271	5GA-T27	Tone Comp.
C79	.01	400	73561	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C80	.0047	600	73920	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Audio Output Plate †
C81	.022	400	73562	P488-022	DF-203	PTE4S2		4TM-S22	Sync. Sep. Cathode
C82	.01	400	73561	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Sync. Sep. Cathode
C83	.001	600	73643	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Vert. Sync. Coupling
C84	.001	600	75643	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Vert. Feedback
C85	100		45233	S1100	D6-101	5W5T1	GP1K-101	5GA-T1	Vert. Sync. Amp. Plate
C86	.01	400	73561	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Vert. Sync. Coupling
C87	.0022	600	73595	P688-0022	D6-222	PTE6D2	GP2-333-222	6TM-D22	Vert. Integrator Net.
C88	.0047	600	73920	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Vert. Integrator Net.
C89	.01	600	73594	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Vert. Osc. Grid Cap.
C90	.047	600	73692	P688-047	DF-503	PTE6S5		6TM-S47	Vert. Discharge
C91	.22	600	74957	684-25		GP6P25		6TM-P25	Vert. Sweep Coupling
C92	.0022	1000	73803	P1088-0022		PTE1SD2		MB-D22	Vert. Output Plate
C93	.022	400	73562	P488-022	DF-203	PTE4S2		4TM-S22	Vert. Output Plate
C94	.022	400	73563	P488-022	DF-203	PTE4S2		4TM-S22	Fixed Trimmer
C95	.1	600	73557	P688-1	DF-104	PTE6P1		6TM-P1	Fixed Trimmer
C96	.1	400	73551	P488-1	DF-104	PTE4P1		4TM-P1	Vert. Sweep Coupling
C97	.022	600	73798	P688-022	DF-203	PTE6S2		6TM-S22	Integrator Net.
C98	.001	600	75643	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Horiz. Sync. Coupling
C99	100		45233	S1100	D6-101	5W5T1	GP1K-101	5GA-T1	Horiz. Sync. Coupling
C100	82	1000	73090						Horiz. Sync. Coupling
C101	150		44202	S1150	D6-151	5W5T15	GP2K-151	5GA-T15	Horiz. Sync. Amp. Cathode
C102	.47	200	73787	P288-47		GT2P5		2TM-P47	AFC Filter
C103	.022	400	73562	P488-022	DF-203	PTE4S2		4TM-S22	AFC Filter
C104	.047	400	73553	P488-047	DF-503	PTE4S5		4TM-S47	AFC Filter
C105	.047	600	73592	P688-047	DF-503	PTE6S5		6TM-S47	AFC Plate
C106	82	500	73090						Horiz. Feedback
C107	270	500	76579	1469-0003		5R5T3		MS-33	Horiz. Osc. Grid Cap.
C108	.01	600	73594	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Fixed Trimmer
C109	.0015	600	76508	P688-0015	D6-152		GP2L-152	6TM-D15	Horiz. Discharge
C110	.001	1000	73801	P1088-001					Horiz. Sweep Coupling
C111	.047	600	73592	P688-047	DF-503	PTE6S5		6TM-S47	Horiz. Output Screen
C112	.47	200	73787	P288-47		GT2P5		2TM-P47	Horiz. Output Cathode
C113	33		78577						Fixed Trimmer
C114	.068	1000	73815	P1088-068					Damper Filter †
C115	.068	1000	73815	P1088-068					Damper Filter
C116	.47	200	73787	P288-47		GT2P5		2TM-P47	Damper Filter
C117	180		76575						Fixed Padder
C118	150		78578						Damper Fil.
C119	500	30000	76488			TV1-503			HV Filter
C120	.01	400	73561	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Accelerating Anode Dec.
C121	270	500	76579	1468-0003	D6-271	5W5T3	GP2K-271	MS-33	Voltage Divider
C122	.047	400	75071	P488-047	DF-503	PTE4S5		4TM-S47	Line Filter
C123	.047	400	75071	P488-047	DF-503	PTE4S5		4TM-S47	Line Filter
C124	1500		73748	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	Horiz. Output Fil. *
C125	150			S1150	D6-151	5W5T15	GP2K-151	5GA-T15	Vert. Sync. Feedback *

* Not used in all models.
† Some models use 0033MFD in this application (Part No. 73795).
‡ Some models use 02₇ MFD in this application (Part No. 76683).

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1	1.5Meg	½	76171				Volume Control & Switch-See Note 1
R2A	15KΩ	½	76445				Contrast Control Tapped @ 5KΩ and 10KΩ
B	200K	½	76444				Brightness Control.
			Concentrikit				
R3A	1Meg	½	Bll-137 *			SBB-588	Vertical Hold Control - Panel
B	50KΩ		76443 Bll-123 *				Horizontal Hold Control - Rear
C	Shaft end		E-187 *				Attach per instructions in "Concentrikit".
R4A	500KΩ	½	Qll-123		AM-44-S	AN-31	AGC Control
B	Shaft		Not Req.		FKS-1/4	AK-1	Attach to R4A per instructions
R5A	1500Ω	½	76449 Qll-119		AM-32-S	AN-22	Vertical Linearity Control
B	Shaft		Not Req.		FKS-1/4	AK-1	Attach to R5A per instructions
R6A	2.5Meg	½	76448 Q19-139X		AG-84-S	B-83	Height Control
B	Shaft		Not Req.		FKS-1/4	AK-1	Attach to R6A per instructions
R7A	10KΩ	½	76497 Qll-116		AG-27-S	B-14	Vertical Peaking Control
B	Shaft		Not Req.		FKS-1/4	Not Req.	Attach to R7A per instructions
R8	500Ω	2	76496		W-500	43-500	VK-127 Horizontal Linearity Control

* Additional parts to be used with Concentrikit.
Note 1: Tone switch attached to front of volume control.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE SPECIFIED
R9	3300Ω	½			Antenna Coil Shunt
R10	3300Ω	½			AGC Network
R11	150Ω 20%	½			AGC Network
R12	47Ω	½			RF Amplifier Cathode
R13	82Ω	½			RF Amplifier Cathode
R14	470KΩ 20%	½			RF Amplifier Grid
R15	1000Ω 20%	½			RF Amplifier Decoupling
R16	1000Ω 20%	½			RF Amplifier Decoupling
R17	100KΩ 20%	½			Isolation
R18	100KΩ 20%	½			Mixer Grid
R19	3300Ω	½			RF Coil Shunt
R20	100KΩ 20%	½			Oscillator Grid
R21	10KΩ 20%	½			Oscillator Plate
R22	3.3Meg 5%	1	31417	BTA-3.3Meg5%	AGC Network
R23	10KΩ	½	503310	BTS-10K	AGC Network
R24	220KΩ 5%	½	502422	BTS-220K 5%	AGC Network
R25	100Ω 20%	½	504110	BTS-100	Decoupling
R26	100Ω 20%	½	504110	BTS-100	Decoupling
R27	1000Ω	½	503210	BTS-1000	AGC Network
R28	6800Ω	½	503268	BTS-6800	AGC Network
R29	100Ω 5%	½	502110	BTS-100 5%	1st. Video IF Cathode
R30	33KΩ	½	503333	BTS-33K	1st. Video IF Screen
R31	1000Ω	½	503210	BTS-1000	1st. Video IF Plate
R32	1000Ω	½	503210	BTS-1000	2nd. Video IF Grid
R33	56Ω 5%	½	502056		2nd. Video IF Cathode
R34	33KΩ	½	503333	BTS-33K	2nd. Video IF Screen
R35	1000Ω	½	503210	BTS-1000	2nd. Video IF Plate Decoupling
R36	100KΩ	½	503410	BTS-100K	Isolation
R37	56KΩ	½	503356	BTS-56K	AGC Network
R38	10KΩ	½	503310	BTS-10K	AGC Network
R39	150KΩ	½	503415	BTS-150K	AGC Network
R40	47KΩ	½	503347	BTS-47K	Voltage Divider
R41	120KΩ	½	503412	BTS-120K	Voltage Divider
R42	8.3Meg	½	503582	BTS-8.2Meg	Volta ge Divider
R43	68Ω 5%	½	34763		3rd. Video IF Cathode
R44	10KΩ	½	503310	BTS-10K	3rd. Video IF Screen
R45	2200Ω	½	503222	BTS-2200	3rd. Video IF Plate Decoupling
R46	6800Ω 5%	½	14659	BTS-6800 5%	IF Coil Shunt
R47	56KΩ 5%	½	30650	BTS-56K 5%	IF Coil Shunt
R48	180Ω	½	503118	BTS-180	4th. Video IF Cathode
R49	39KΩ	½	503339	BTS-39K	4th. Video IF Screen - See Note 1
R50	6800Ω	1	513268	BTA-6800	4th. Video IF Plate Decoupling
R51	8200Ω	½	503282	BTS-8200	Voltage Divider - See Note 2
R52	10KΩ	2	523310	BTB-10K	Voltage Divider
R53	1000Ω	½	503210	BTS-1000	Isolation
R54	3900Ω 5%	½	30694	BTS-3900 5%	Video Amplifier Grid
R55	43Ω 5%	½	502043		Video Amplifier Cathode
R56	6750Ω	10	76642	1 3/4A-7000	Video Amplifier Plate Wire-Wound
R57	680Ω	½	503168	BTS-680	Contrast Network
R58	5600Ω	1	513256	BTA-5600	Contrast Network
R59	10KΩ	1	513310	BTA-10K	Voltage Divider
R60	150KΩ	½	503415	BTS-150K	Voltage Divider
R61	470KΩ	½	503447	BTS-470K	Picture Tube Cathode
R62	1000Ω	½	503210	BTS-1000	Picture Tube Cathode See Note 2
R63	250KΩ 20%	1	504415	BTA-250K	Voltage Divider
R64	100KΩ	1	513410	BTA-100K	Voltage Divider
R65	470KΩ 20%	½	504447	BTS-470K	1st. Sound IF Grid
R66	82Ω 5%	½	13961	BTS-82 5%	1st. Sound IF Cathode
R67	1000Ω 20%	½	504210	BTS-1000	1st. Sound IF Screen
R68	1000Ω 20%	½	504210	BTS-1000	1st. Sound IF Decoupling
R69	47KΩ	½	503347	BTS-47K	2nd. Sound IF Grid
R70	68Ω 5%	½	34763		2nd. Sound IF Cathode
R71	33KΩ	½	503333	BTS-33K	2nd. Sound IF Screen
R72	1000Ω 20%	½	504210	BTS-1000	2nd. Sound IF Decoupling
R73	56KΩ	½	503356	BTS-56K	Bleeder
R74	47Ω 5%	½	30732		Balancing
R75	39KΩ	½	503339	BTS-39K	De-emphasis
R76	1200Ω 5%	½	30731	BTS-1200 5%	Balancing
R77	3000Ω 5%	½	34766	BTS-3000 5%	Balancing
R78	6800Ω 5%	½	14659	BTS-6800 5%	Ratio Detector Diode Load
R79	6800Ω 5%	½	14659	BTS-6800 5%	Ratio Detector Diode Load
R80	18KΩ	½	503318	BTS-18K	Tone Compensation
R81	22KΩ	½	503322	BTS-22K	Tone Compensation.
R82	27KΩ	½	503327	BTS-27K	Tone Compensation
R83	10Meg 20%	½	504610	BTS-10Meg	Audio Amplifier Grid
R84	330KΩ	½	503433	BTS-330K	Audio Amplifier Plate
R85	470KΩ 20%	½	504447	BTS-470K	Audio Output Grid
R86	100Ω	½	503110	BTS-100	Audio Output Cathode
R87	330Ω	1	76465	BTA-330	Audio Output Cathode Wire-Wound
R88	470Ω	1	76467	BTA-470	Audio Output Decoupling Wire-Wound
R89	150KΩ	½	503415	BTS-150K	AGC Amplifier Grid
R90	100KΩ	½	503410	BTS-100K	Voltage Divider
R91	33KΩ	½	503333	BTS-33K	Voltage Divider
R92	220KΩ	½	503422	BTS-220K	Horizontal Sync.Seperator Cathode
R93	1200Ω	½	503212	BTS-1200	Horizontal Sync. Seperator Plate
R94	1Meg 20%	½	504510	BTS-1Meg	Horizontal Sync. Amplifier Grid
R95	12KΩ	1	513312	BTA-12K	Horizontal Sync. Amplifier Plate
R96	3.9Meg	½	503539	BTS-3.9Meg	Horizontal Sync. Amplifier Grid
R97	820Ω	½	503182	BTS-820	Horizontal Sync. Amplifier Cathode
R98	18KΩ	½	503318	BTS-18K	Isolation
R99	150KΩ	½	503415	BTS-150K	Isolation
R100	8.2Meg	½	503582	BTS-8.2Meg	Sync. Seperator Cathode See Note 3
R101	680KΩ	½	503468	BTS-680K	Sync. Seperator Plate
R102	470KΩ	½	503447	BTS-470K	Sync. Peaking See Note 4
R103	470KΩ	½	503447	BTS-470K	Sync. Peaking See Note 2
R104	1.5Meg	½	503515	BTS-1.5 Meg	Vertical Sync. Amplifier Grid
R105	220KΩ	½	503422	BTS-220K	Vertical Sync. Amplifier Plate
R106	22KΩ	½	503322	BTS-22K	Vertical Sync. Amplifier Plate
R107	22KΩ	½	503322	BTS-22K	Integrator Network
R108	22KΩ	½	503322	BTS-22K	Integrator Network
R109	8200Ω	½	503282	BTS-8200	Integrator Network
R110	1Meg 20%	½	504510	BTS-1Meg	Vertical Osc. Trans. Shunt
R111	1Meg 5%	½	502510	BTS-1Meg 5%	Vertical Osc. Grid
R112	10Meg	½	503810	BTS-10Meg	Vertical Osc. Grid
R113	820KΩ	½	503482	BTS-820K	Vertical Osc. Plate
R114	10KΩ	½	503310	BTS-10K	Vertical Peaking
R115	3.3Meg 5%	½	502533	BTS-3.3Meg 5%	Vertical Output Grid
R116	1000Ω	1	513210	BTA-1000	Vertical Output Cathode
R117	560Ω	½	503156	BTS-560	Vertical Output Decoupling

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA PART No.	IRC PART No.	IDENTIFICATION CODES
R118	68KΩ 5%	1	512368	BTA-68K 5%	Vertical Peaking
R119	10KΩ	½	503310	BTS-10K	Voltage Divider
R120	220KΩ	½	503422	BTS-220K	Voltage Divider
R121	150KΩ	½	503415	BTS-150K	Voltage Divider
R122	270KΩ	½	503427	BTS-270K	Voltage Divider
R123	2700Ω	½	503227	BTS-2700	Vertical Integrator
R124	82KΩ	1	513382	BTA-82K	Voltage Divider
R125	68KΩ	1	513368	BTA-68K	Voltage Divider
R126	330KΩ	½	503433	BTS-330K	Horizontal Control Grid
R127	820KΩ	½	503482	BTS-820K	Horizontal Control Grid
R128	68KΩ	1	513368	BTA-68K	Horizontal Control Cathode
R129	150KΩ 5%	1	512415	BTA-150K 5%	Horizontal Control Cathode
R130	3900Ω	½	503239	BTS-3900	Horizontal AFC Filter
R131	68KΩ 5%	1	512368	BTS-68K 5%	Horizontal Oscillator Grid
R132	8200Ω 5%	½	502282	BTS-8200 5%	Horizontal Oscillator Trans. Shunt
R133	18KΩ	½	503318	BTS-18K	Horizontal Oscillator Trans. Shunt
R134	56KΩ 5%	1	512356	BTA-56K 5%	Horizontal Oscillator Plate
R135	150KΩ	½	503415	BTS-150K	Horizontal AFC Feedback
R136	390KΩ	½	503439	BTS-390K	Voltage Divider
R137	390KΩ	½	503439	BTS-390K	Volta ge Divider
R138	47Ω 20%	½	504047		Parasitic Suppressor
R139	1Meg	½	503510	BTS-1Meg	Horizontal Output Grid
R140	100Ω	2	523110		Horizontal Output Cathode
R141	8200Ω	2	76504	BTB-8200	Horizontal Output Screen Wire-Wound
R142	8200Ω	2	76504	BTB-8200	Horizontal Output Screen Wire-Wound
R143	82KΩ	1	513382	BTA-82K	Horizontal Output Screen
R144	200Ω	5	76682	1 3/4A- 200	Horizontal Linearity Wire-Wound
R145	1.5Ω 5%	1	76468		H.V. Rectifier Filament Wire-Wound
R146	100Meg	2	76648		H.V. Filter
R147	A 950Ω	10		2D-1000	Voltage Divider Wire-Wound
	B 450Ω	6		1 3/4A-450	Voltage Divider Wire-Wound
	C 1500Ω	5	76499	1 3/4A-1500	Voltage Divider Wire-Wound
	D 1200Ω	1		1 3/4A-1200	Voltage Divider Wire-Wound
	E 30KΩ	5		1 3/4A-10K	Voltage Divider Wire-Wound
	F 7KΩ	5		1 3/4A-7K	Voltage Divider Wire-Wound

Note 1: Some Models may use a 33KΩ Resistor in this application
Note 2: Not used in all Models
Note 3: Some Models may use a 5.6Meg Resistor in this application
Note 4: Some Models may use a 1Meg Resistor in this application

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @2.7A	700VCT .390ADC	5.0VAC @6.0A SEC.4 6.3VAC @1.5A	6.3VAC @9.5A SEC.5 6.3VAC @2.4A	76495			

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	165Ω	1310Ω	74144	A-8122	A-4000①	TBO-2	Vert. Blocking Osc.
T3	300Ω tapped @10Ω	0Ω	76501		HVO-8		Horiz. Output Trans.
T4	650Ω	.5Ω	76494	A-8140①	P-3080①		Vert. Output Trans.
T5A	30Ω		76653		MDF-30		Hor. Deflection Coils
B	3.5Ω						Vert. Deflection Coils

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T6	7KΩ	3.4Ω	370Ω	.4Ω	75520	A-3878①	A-3020	RO-13①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA RCA PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	P.M.	3.4Ω	76389	12J12	12A31	
	CONE DIA.	V. C. DIA.				
SP2	11 5/8 in.	1 in.				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 ~(*)	REPLACEMENT DATA RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.290A	39Ω	.8H	76498	C-2326①	C-2996①	TR-3300①	① Drill one new mounting hole.

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA RCA PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA IRC PART No.	NOTES
L2	Ant. Coil	.6Ω	.6Ω	73591			
L3	Ant. Coil	.6Ω	.6Ω	73591			
L4	IF Trap	0Ω		76542			Antenna Matching Trans. Complete, Part #76536
L5	Ant. Shunt	0Ω		76538			
L6	Ant. Shunt	0Ω		76537			
L7	IF Trap	0Ω		76541			
L8	FM Trap	0Ω		76540			
L9	Ant. Coils	0Ω		76554			Complete with Rotor, Coils, and C13
L10	RF GridCoils	0Ω		76556			Complete with Rotor, Coils, C12, R9 and R10.
L11	RF Grid Coil	0Ω		76561			
L12	RF Plate Coils	0Ω		76553			Complete with Rotor, Coils C23 and R16.
L13	RF Plate Coil	0Ω		76529			Includes Trimmer .8-3.8MMF
L14	RF Coupling Coil	0Ω		76562			
L15	Video Trap	0Ω		76535			
L16	Fil. Choke	0Ω		73477			
L17	Mixer Grid Coils	0Ω		76551			Complete with Rotor, Coils, C21, C22, R17, R18, and R19
L18	Mixer Grid Coil	0Ω		76560			Channel 13
L19	Osc. Coils	0Ω		76546			Complete with Rotor, Coils, C25 and C26
L20	Fil. Choke	0Ω		76563			
L21	Fil. Choke	0Ω		76564			
L22	Fil. Choke	0Ω					
L23	Conv. Plate	.3Ω	.1Ω	76528			
L24	1st. Video IF	0Ω	.2Ω	76432			Includes Trap
L25	2nd Video IF Primary	.1Ω		76434			Includes Sound Trap
L26	2nd Video IF Secondary	.1Ω		76435			Includes Adj. Sound Trap
L27	Fil. Choke	0Ω		73477			
L28	3rd Video IF	.2Ω	.2Ω	76433			
L29	4th Video IF	.2Ω	.2Ω	76433			
L30	Sound Take-Off	6.2Ω		76437			Tap at 5Ω
L31	Peaking Coil	3.6Ω		76646			72 Microhenries, Orange, Red Dots, Wound on 3.3K Resistor
L32	Peaking Coil	12Ω		76509			500 Microhenries, Green, Orange Dots, Wound on 6.8K Resistor.
L33	4.5MC Trap	3Ω			TV-151		Blue, Yellow Dots, Wound on 47MMF Cap.
L34	Peaking Coil	12Ω		71526	TV-185		250Microhenries, Green Dot
L35	Peaking Coil	7.3Ω		76647	TV-182		180Microhenries, White, Yellow Dots, Wound on 22K Resistor.
L36	Sound IF	5.4Ω	3.2Ω	76438	TV-108		
L37	Ratio Det. Trans.	4.2Ω	.2Ω	76439	TV-110		Tapat .2Ω
L38	Horiz. Osc.	70Ω	44Ω	76440			
L39	Anti-Ringing Coil	2.8Ω		76510		CL-1	4.7Microhenries
L40	Anti-Ringing Coil	.72Ω		76640		CL-1	1.5Microhenries
L41	Anti-Ringing Coil	.72Ω		76640		CL-1	1.5 Microhenries
L42	Width Coil	120Ω		76484			
L43	Horiz. Lin.	12Ω		76483	MWC-2		

FUSES

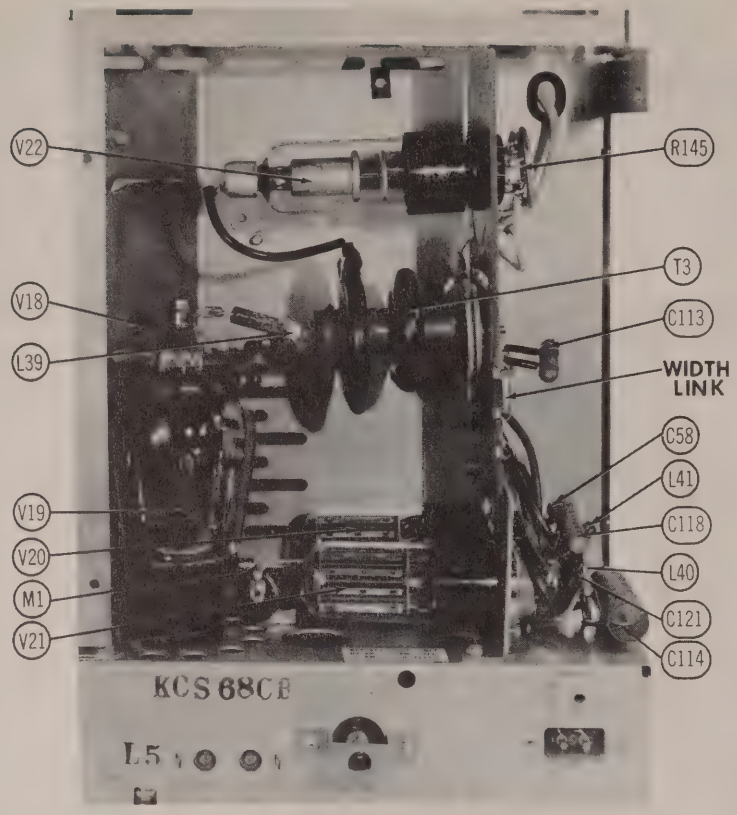
ITEM No.	TYPE	RATING	REPLACEMENT DATA RCA PART No. FUSE	REPLACEMENT DATA RCA PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	REMARKS
M1	3AG	1/4A	73600		318.250		

DIAL LIGHTS

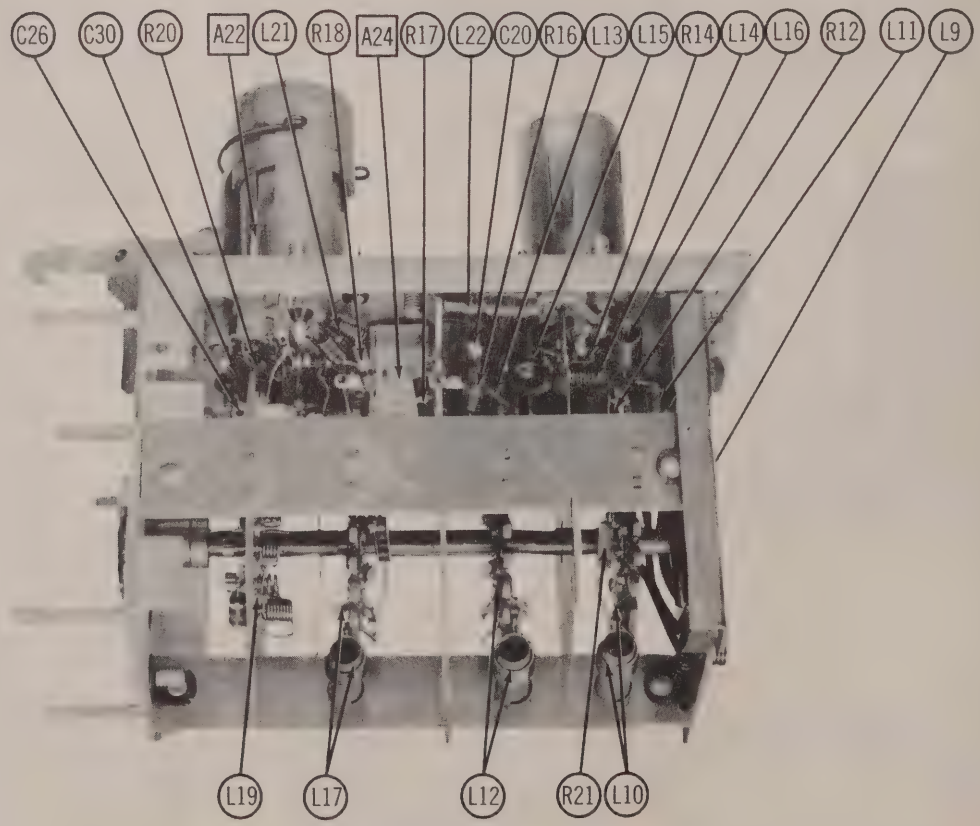
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA RCA PART No.	REPLACEMENT DATA	NOTES
M2	Bayonet	7.5	.2	White	11765	Type No. 51	
M3	Bayonet	7.5	.2	White	11765	Type No. 51	

MISCELLANEOUS

ITEM No.	PART NAME	RCA PART No.	NOTES
M4	RF Tuner		
M5	5th Video IF Resistor		39KΩ
	Capacitor		5MMF
	Capacitor		10MMF
	Crystal	76675	1N60
	RF Choke		36Microhenries
			Det. Assy. Complete PT. #76436
M6	Switch	76493	Tone for Phono and TV
M7	Focus Magnet	76652	
M8	Ion Trap	76141	
B3, B4	Trimmer	52217	Horiz. Drive and Horiz. Lock (Dual) 10-160MMF
	Knob	76595	Brightness, Vert, Hold (Maroon)
	Knob	76625	Brightness Vert. Hold (Tan)
	Knob	76596	Brightness Vert. Hold (Beige)
	Knob	76593	Channel Selector (Maroon)
	Knob	76624	Channel Selector (Tan)
	Knob	76594	Channel Selector (Beige)
	Knob	76591	Fine Tuning (Maroon)
	Knob	76623	Fine Tuning (Tan)
	Knob	76592	Fine Tuning (Beige)
	Knob	74963	Contrast, Horiz. Hold and OFF/ON Volume (Maroon)
	Knob	74001	Contrast Horiz. Hold and off/on Volume (Tan)
	Knob	75464	Contrast, Horiz. Hold and off/on Volume (Beige)
	Knob	76597	Tone-TV Phono (Maroon)
	Knob	76626	Tone-TV Phono (Tan)
	Knob	76598	Tone-TV Phono (Beige)



HIGH VOLTAGE SUPPLY



RF TUNER-RIGHT SIDE

PHOTOFACT* Folder

SENTINEL MODELS 1U438, 1U439, 1U440, 1U441 1U443, 1U444, 438, 439, 440, 441, 443, 444 (Series 2XD, XD, XXD)

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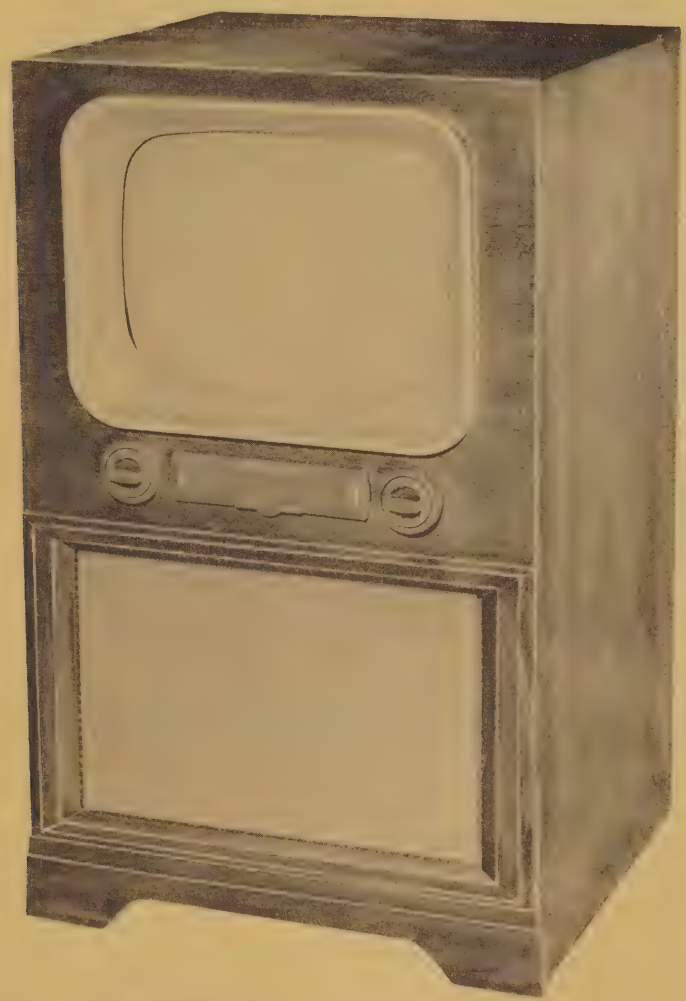

MODEL 1U439

SENTINEL MODELS 1U438, 1U439, 1U440, 1U441, 1U443, 1U444, 438, 439, 440, 441, 443, 444 (Series 2XD, XD, XXD)

HOWARD W. SAMS & CO., INC. • Indianapolis, Indiana

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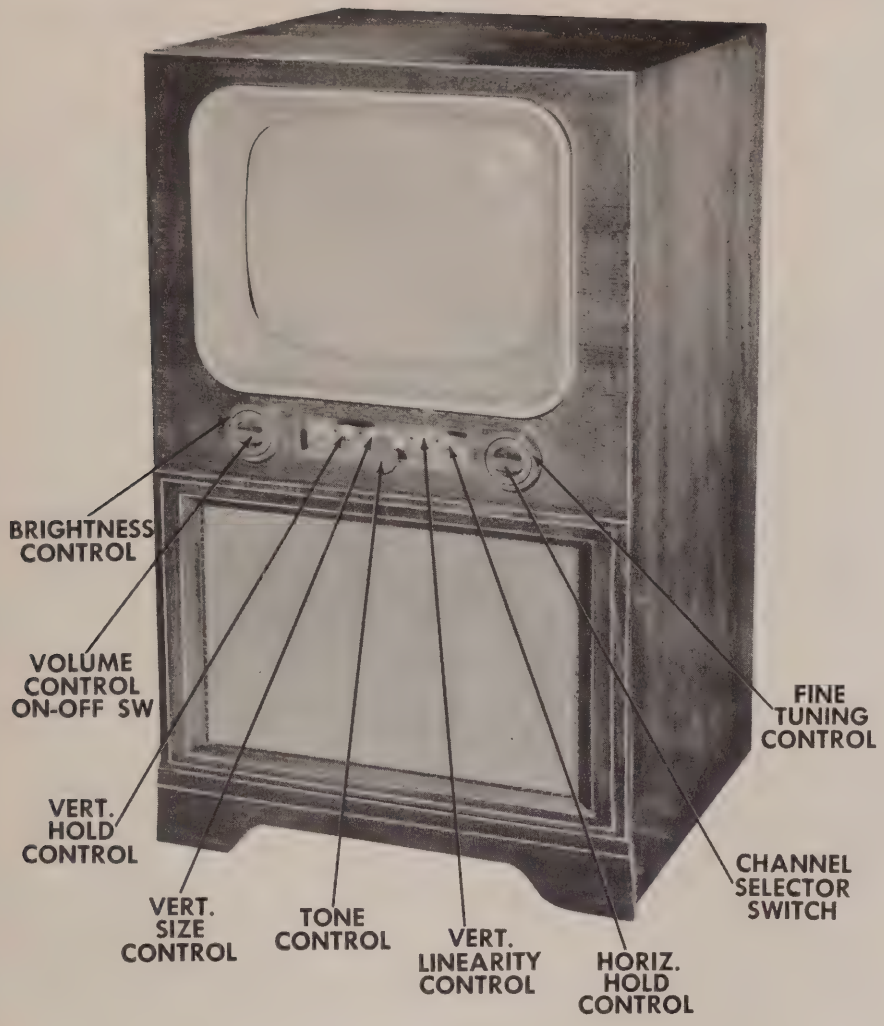
DATE 1-52 SET 157 FOLDER 9

PHOTOFACT* Folder

SENTINEL MODELS 1U438, 1U439, 1U440, 1U441, 1U443, 1U444, 438, 439, 440, 441, 443, 444 (Series 2XD, XD, XXD)



SENTINEL 1U439

TRADE NAME	Sentinel Models 1U438, 1U439, 1U440, 1U441, 1U443, 1U444, 438, 439, 440, 441, 443, 444. Series XD, XXD, 2XD.
MANUFACTURER	Sentinel Radio Corp., 2100 W. Dempster, Evanston, Ill.
TYPE SET	Television Receiver
TUBES	Twenty Three
POWER SUPPLY	110-120 Volts AC-60 Cycle — RATING 1.65 Amp. @ 117 Volts AC
TUNING RANGE—	Channel 2 thru 13

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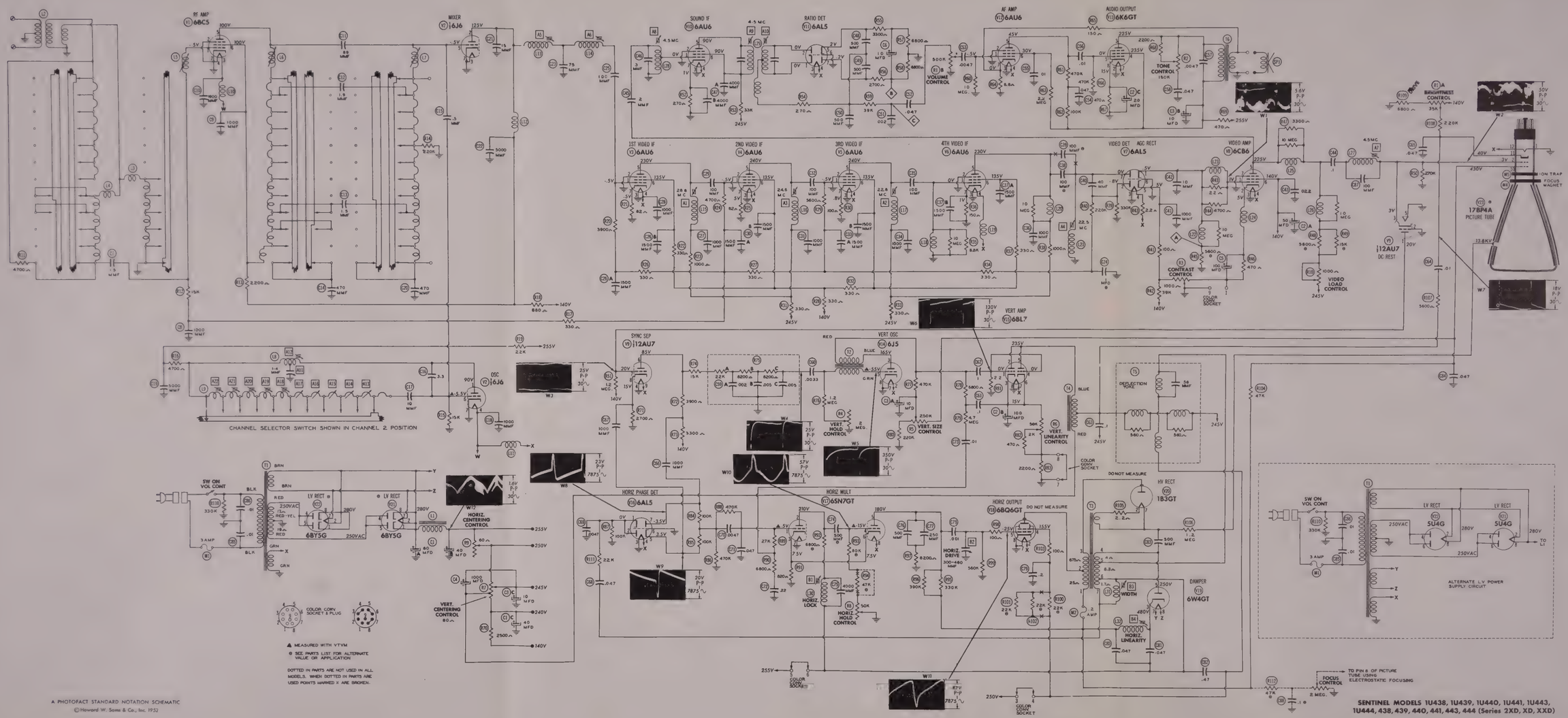
DATE 1-52 SET 157 FOLDER 9

SENTINEL MODELS 1U438, 1U439, 1U440, 1U441, 1U443, 1U444, 438, 439, 440, 441, 443, 444 (Series 2XD, XD, XXD)



▲ MEASURED WITH VTVM

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED ≡ ARE BROKEN.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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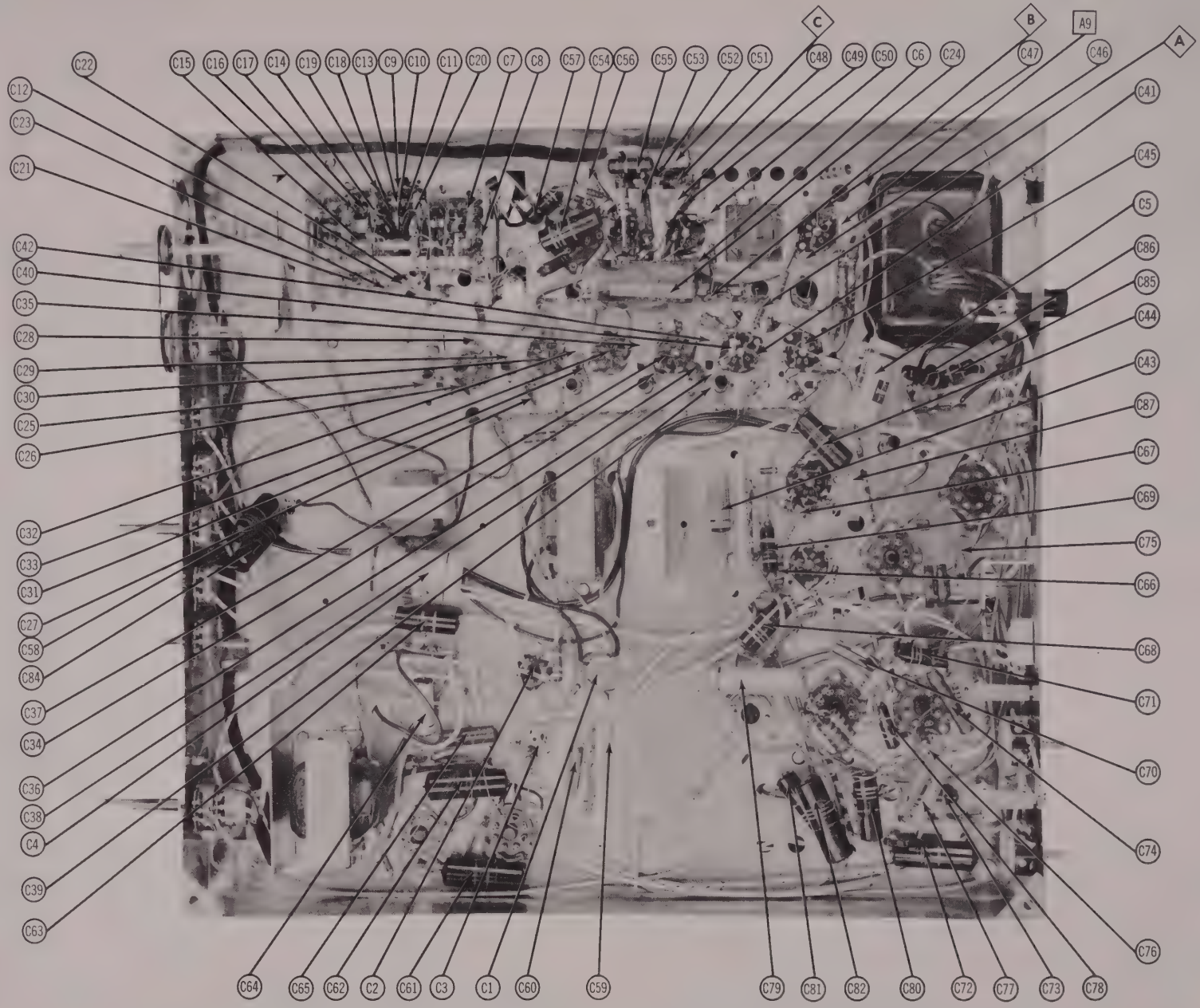
SENTINEL MODELS 1U438, 1U439, 1U440, 1U441, 1U443, 1U444, 438, 439, 440, 441, 443, 444 (Series 2XD, XD, XXD)

SENTINEL MODELS 1U438, 1U439, 1U440, 1U441, 1U443, 1U444, 438, 439, 440, 441, 443, 444 (Series 2XD, XD, XXD)

CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

BOTTOM VIEW

TOP VIEW

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The end of the high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) and replace it with a 6J6 which has Pin 1 removed, this will disable the local oscillator and prevent the possibility of erroneous indications.
Connect the negative lead of a 4.5 volt battery to the ungrounded lead of C25, connect the positive lead to chassis.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	Not used	22.8MC	Any	USE VTVM DC probe to point (A). Common to chassis.	A1, A2	Adjust for maximum deflection.
2.	"	"	"	24.6MC	Any	"	A3	"
3.	"	"	"	25.5MC	"	"	A4	"
4.	"	"	24MC (10MC Swp)	22MC 23MC 25.5 MC	"	Vert. Amp. to point (A). Low side to chassis.	A5, A6	Adjust for response curve similar to fig.1. If necessary retouch A1 thru A4 for proper response.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.01MFD	High side to pin 1, (grid) of 6CB6, (V8). Low side to chassis.	Not used	4.5MC (400∿AM mod)	Any	Vert. Amp. Thru 33KΩ to pin 2 of picture tube. Low side to chassis.	A7	Adjust for MINIMUM 400∿ indication on scope.

After alignment is completed tune in a strong signal and examine the picture for 4.5MC beat interference , (grain appearance in horizontal lines.) If necessary retouch A7 to minimize the interference.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD	High side to pin 1, (grid) of 6CB6, (V8). Low side to chassis.	4.5MC (unmod)	Any	DC probe to point (B). Common to chassis.	A8, A9	Adjust for maximum deflection.
7.	"	"	"	"	DC probe to point (C). Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.01MFD	High side to pin 1, (grid) of 6CB6, (V8). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (B) Low side to chassis.	A8, A9	Disconnect stabilizor capacitor C6. Adjust for maximum amplitude and symmetry as per fig. 2.
7.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A10	Reconnect capacitor C6. Adjust A10 so 4.5 MC occurs at center of crossover lines as per fig. 3. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

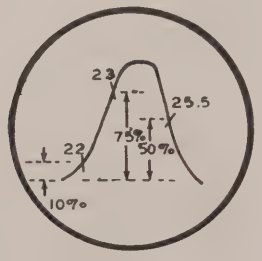


FIG.1

FIG. 2

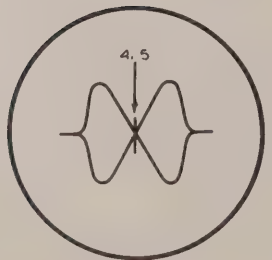


FIG. 3

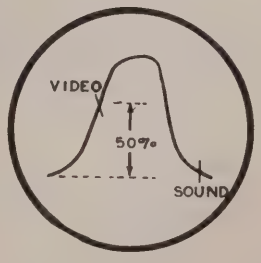


FIG. 4

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Leave the 4.5 volt bias connected.
The oscillator padder adjustment, (A11), may require adjustment if the oscillator tube has been replaced and all channels are off an equal amount. If adjustment of A11 will not render correct oscillator operation on all active channels the individual channel adjustment for each active channel must be adjusted. It is essential that the highest channel be adjusted first and progress towards the lowest channel.
Notice that channels 12 and 13 have a common adjustment. This adjustment should be made on whichever channel is active in the area.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC swp.)	211.25MC 215.75MC	13	Vert. amp. to Point (A). Low side to chassis.	A12	Adjust to place video marker at 50% as shown in Fig. 4. See note above concerning channels 12 and 13.
			207MC (10MC swp.)	205.25MC 209.75MC	12			
			201MC (10MC swp.)	199.25MC 203.75MC	11		A13	
			195MC (10MC swp.)	193.25MC 197.75MC	10		A14	
			189MC (10MC swp.)	187.25MC 191.75MC	9		A15	
			183MC (10MC swp.)	181.25MC 185.75MC	8		A16	
			177MC (10MC swp.)	175.25MC 179.75MC	7		A17	
			85MC (10MC swp.)	83.25MC 87.75MC	6		A18	
			79MC (10MC swp.)	77.25MC 81.75MC	5		A19	
			69MC (10MC swp.)	67.25MC 71.75MC	4		A20	
			63MC (10MC swp.)	61.25MC 71.75MC	3		A21	
			57MC (10MC swp.)	55.25MC 59.75MC	2		A22	

THE RF AND MIXER PORTION OF THIS TUNER HAS BEEN PROPERLY ALIGNED AT THE FACTORY AND IS VERY STABLE. ALIGNMENT OF THIS PORTION SHOULD NOT BE REQUIRED IN THE FIELD.

RESISTANCE MEASUREMENTS

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	565KΩ	0Ω	.1Ω	0Ω	†5.5KΩ	†5.5KΩ	0Ω		
V 2	6J6	†27KΩ	†3.3KΩ	0Ω	.2Ω	220KΩ	15KΩ	0Ω		
V 3	6AU6	550KΩ	0Ω	0Ω	.1Ω	†1.5KΩ	†3.3KΩ	82Ω		
V 4	6AU6	550KΩ	0Ω	0Ω	.1Ω	†480Ω	†2.9KΩ	82Ω		
V 5	6AU6	550KΩ	0Ω	0Ω	.1Ω	†480Ω	†3.3KΩ	100Ω		
V 6	6AU6	3.5Ω	0Ω	0Ω	.8Ω	†1.5KΩ	†3.6KΩ	150Ω		
V 7	6AL5	5.6KΩ	330KΩ	0Ω	1.5Ω	500Ω	0Ω	.2Ω		
V 8	6CB6	5.6KΩ	1KΩ	0Ω	.1Ω	†5.2KΩ	†2.6KΩ	0Ω		
V 9	12 AU7	†1.2Meg	0Ω	270KΩ	0Ω	0Ω	†9.8KΩ	†1.2Meg	2.7KΩ	.1Ω
V 10	6AU6	.9Ω	0Ω	0Ω	.1Ω	†33KΩ	†33KΩ	270Ω		
V 11	6AL5	Inf.	Inf.	0Ω	.1Ω	10KΩ	0Ω	5.5KΩ		
V 12	6AU6	10Meg	0Ω	0Ω	.1Ω	†570KΩ	2.2Meg	6.8Ω		
V 13	6K6GT	Inf.	0Ω	†1KΩ	†565Ω	470KΩ	†100KΩ	.1Ω	470Ω	
V 14	6J5	0Ω	.1Ω	#660KΩ	#660KΩ	2.2Meg	#660KΩ	0Ω	0Ω	
V 15	6BL7GT	2.2Meg	†900Ω	925Ω	2.2Meg	†900Ω	925Ω	.1Ω	0Ω	
V 16	6AL5	100KΩ	100KΩ	0Ω	.1Ω	570KΩ	0Ω	570KΩ		
V 17	6SN7GT	940KΩ	†6.8KΩ	820Ω	120KΩ	#165KΩ	820Ω	0Ω	.1Ω	
V 18	6BQ6GT	Inf.	.1Ω	†7.5KΩ	†7.5KΩ	560KΩ	560KΩ	0Ω	0Ω	TOP CAP #42Ω
V 19	6W4GT	Inf.	Inf.	280KΩ	Inf.	†95Ω	Inf.	†0Ω	†.1Ω	
V 20	1B3GT	PINS 1 THROUGH8 HAVE INF RESISTANCE								TOP CAP #700Ω
V 21	6BY5G	25KΩ	†0Ω	Inf.	19Ω	19Ω	Inf.	†.1Ω	25KΩ	
V 22	6BY5G	25KΩ	†0Ω	Inf.	17Ω	17Ω	Inf.	†.1Ω	25KΩ	
V 23	17BP4A	0Ω	270KΩ	PIN 10 #47KΩ	PIN 11 235KΩ	PIN 12 .1Ω				

ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PINS 1 AND 8 OF V21 AND V22
# MEASURED FROM PIN 3 OF V19

DISASSEMBLY INSTRUCTIONS

1. Remove 5 push on type control knobs from front panel.
2. Remove 9 wood screws from back cover. Remove cover.
3. Disconnect built-in antenna.
4. Disconnect speaker.
5. Remove 5 chassis bolts. Remove chassis.

Note: For picture tube removal, it is necessary to remove chassis as outlined above.

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA SENTINEL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C47A	4000		23E2037	BPD-2X004	D6-402	ID5D4	822-004	5HK-2D4	Sound IF DeCoupling
B	4000				D6-403	ID5D4			Sound IF Cathode
C48	500	500	23E45-10	1468-0005	D6-501	5W5T5	GP2K-501	1FM-35	Diode Load Cap.
C49	500	500	23E45-10	1468-0005	D6-501	5W5T5	GP2K-501	1FM-35	Diode Load Cap.
C50	500	500	23E45-10	1468-0005	D6-501	5W5T5	GP2K-501	1FM-35	Diode Load Cap.
C51	.002	600	23E3406	P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	De-emphasis
C52	.047	200	23E3214	P288-047	DF-503	PTE6S5		2TM-S47	Audio Coupling
C53	.0047	600	23E3606	P688-0047	D6-473	PTE6D5	GP2-333-472	6TM-D47	Audio Coupling
C54	.047	600	23E3614	P688-047	DF-503	PTE6S5		6TM-S47	RF Bypass
C55	.01	400	23E3410	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	AF Amp. Screen
C56	.01	600	23E3610	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling
C57	.0047	600	23E3606	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Audio Output Plate
C58	.047	600	23E3614	P688-047	DF-503	PTE6S5		6TM-S47	Tone Comp.
C58A	.002			P688-002		PTE6D2	GP2-333-202	2TM-S47	Vert. Integrator Net.
B	.005		♦ 23E2023-4	P688-005	♦ PC-100	PTE6D5	GP2-333-502	♦101C1	Vert. Integrator Net.
C	.005			P688-005		PTE6D5	GP2-333-502		Vert. Integrator Net.
C60	.0033	400	23E3407	P688-0033	D6-332	PTE6D3	GP2-333-332	6TM-D3	Vert. Osc. Grid Cap.
C61	.1	600	23E3616	P688-1	DF-104	PTE6P1		6TM-P1	Vert. Discharge
C62	.1	600	23E3616	P688-1	DF-104	PTE6P1		6TM-P1	Vert. Sweep Coupling
C63	.1	400	23E3416	P488-1	DF-104	PTE4P1		4TM-P1	Fixed Trimmer
C64	.01	600	23E3610	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Vert. Feedback
C65	.047	200	23E3214	P288-047	DF-503	PTE4S5		2TM-S47	Picture Tube Cathode
C66	1000		23E2012	SI1000	D6-102		GP2L-102	5HK-D1	Horiz. Sync. Coupling
C67	1000		23E2012	SI1000	D6-102		GP2L-102	5HK-D1	Horiz. Sync. Coupling
C68	.047	600	23E3614	P688-047	DF-503	PTE6S5		6TM-S47	Horiz. Feedback
C69	.0047	400	23E3608	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Voltage Divider
C70	.0047	200	23E3608	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Horiz. AFC Coupling
C71	.047	200	23E3214	P288-047	DF-503	PTE4S5		2TM-S47	AFC Filter
C72	.22	200	23E3218	P488-22		GT4P25		2TM-P22	Feedback Net.
C73	.01	400	23E3410	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Feedback Net.
C74	500	2000	23E2030-9						Horiz. MV Feedback ¶
C75	4000	500	23E86	1464-004		IDR5D4			Fixed Trimmer
C76	500		23E2030-9						Horiz. Discharge
C77	250		23E2397-3						Horiz. Discharge
C78	.001	600	23E3604	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Horiz. Sweep Coupling
C79	.1	400	23E3418	P488-22		GT4P2		4TM-P22	RF Bypass
C80	.047	600	23E3614	P688-047	DF-503	PTE6S5		6TM-S47	Damper Filter
C81	.047	600	23E3614	P688-047	DF-503	PTE6S5		6TM-S47	Damper Filter
C82	.47	200	23E3220	P288-47		GT2P5		2TM-P47	Horiz. Sweep Coupling
C83	500	20000	23E2039	HV20C	TV3-502				HV Filter
C84	.047	600	23E3614	P688-047	DF-503	PTE6S5		6TM-S47	RF Bypass
C85	.01	400	23E3410	P488-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Line Filter
C86	.01	400	23E3410	P488-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Line Filter
C87	100		23E2027-2	SI100	D6-101	5W5T1	GP1K-101	5GA-T1	Fixed Trimmer
C88	.1	600	23E3616	P688-1	DF-104	PTE6P1		6TM-P1	RF Bypass *

* Not used in all Models
♦ Items C64A, C64B, C64C, R75A, R75B, R75C are combined in one unit
† Some Models use .47 MFD in this application (Part No. 23E3220)
‡ Some Models use 220MMF in this application (Part No. 23E2027-6)
¶ Some Models use 600MMF in this application (Part No. 23E2030-13)

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SENTINEL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	35KΩ	½	28E64	Concentrikit*	RTV-213	SBB-602-S	Brightness Control-Panel
B	500KΩ	½		B13-133*			Volume Control Switch-Rear
C	Shaft End			E-187*			
D	Switch			76-1*			
R2A	150KΩ	½	28E75		AG-52-S		Tone Control
B	Shaft		Not Req.		KSS-3		Attach to R2A per instructions.
R3A	1000Ω	½	28E65	Q11-108	AM-8-S	B-5	Contrast Control
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Attach to R3A per instructions.
R4A	2Meg	½	28E72	Q11-139	AG-83-S	AN-75	Vertical Hold Control.
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R4A per instructions.
R5A	250KΩ	½	28E45	Q11-130	AG-55-S	AN-50	Vertical Size Control.
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R5A per instructions.
R6A	2000Ω	½	28E67	Q11-110	AG-11-S	AN-6	Vertical Linearity See Note.
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R6A per instructions.
R7	80Ω	2	28E78				Vertical Centering Control Wire Wound
R8A	50KΩ	½	28E43	Q11-123	AG-44-S	AN-31	Horizontal Hold Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R8A per instructions.
R9	60Ω	2	28E54	W-60	43-75	VK-117	Horizontal Centering Control Wire Wound
R10	1000Ω	1	28E81				Video Output Plate Load

* Additional parts to be used with "Concentrikit".
♦Connect 100KΩ resistor from center terminal to low side of brightness control.
Note: Some models use this alternate vertical linearity control, PT. No. 28E80
Models Employing Electrostatic Focus use a 2 Meg Focus Control Part #28E72.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SENTINEL PART No.	IRC PART No.	IDENTIFICATION CODES All resistors ± 10% unless otherwise specified
R11	4700Ω	½	27E472-2	BTS-4700	Antenna Loading
R12	15KΩ 20%	½	27E1007-5		RF Amplifier Grid
R13	2200Ω 20%	½	27E222-2	BTS-2200	RF Amplifier Decoupling
R14	220KΩ 20%	½	27E224-2	BTS-220K	Mixer Grid
R15	15KΩ 20%	½	27E1007-5		Oscillator Grid
R16	4700Ω	½	27E472-2	BTS-4700	Oscillator Plate
R17	330Ω	½	27E331-2	BTS-330	AGC Network
R18	680Ω	1		BTA-680	Voltage Dropping
R19	22KΩ	2		BTB-22K	Voltage Dropping
R20	3900Ω	½	27E392-2	BTS-3900	1st Video IF Grid
R21	82Ω	½	27E820-2	BTS-82	1st Video IF Cathode
R22	330Ω	½	27E331-2	BTS-330	1st Video IF Screen
R23	1000Ω	½	27E102-2	BTS-1000	1st Video IF Plate Decoupling

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SENTINEL PART No.	IRC PART No.	IDENTIFICATION CODES	
R24	4700Ω 5%	½	27E1009-26	BTS-4700-5%	2nd Video IF Grid	
R25	82Ω	½	27E820-2	BTS-82	2nd Video IF Cathode	
R26	330Ω	½	27E331-2	BTS-330	AGC Network	
R27	330Ω	½	27E331-2	BTS-330	AGC Network	
R28	330Ω	½	27E331-2	BTS-330	Decoupling	
R29	56000Ω 5%	½	27E1009-8	BTS-5600 5%	3rd Video IF Grid	
R30	100Ω	½	27E101-2	BTS-100	3rd Video IF Cathode	
R31	330Ω	½	27E331-2	BTS-330	Decoupling	
R32	330Ω	½	27E331-2	BTS-330	Decoupling	
R33	330Ω	½	27E331-2	BTS-330	Decoupling	
R34	330Ω	½	27E331-2	BTS-330	AGC Network	
R35	6800Ω 5%	½	27E1009-13	BTS-6800-5%	4th Video IF Grid	
R36	150Ω	½	27E151-2	BTS-150	4th Video IF Cathode	
R37	330Ω	½	27E331-2	BTS-330	4th Video IF Screen	
R38	1000Ω	½	27E102-2	BTS-1000	4th Video IF Plate Decoupling	
R39	330KΩ 20%	½	27E334-2	BTS-330K	AGC Diode Load	
R40	220KΩ 20%	½	27E224-2	BTS-220 K	AGC Network	
R41	100Ω	½	27E101-2	BTS-100	Voltage Divider	
R42	39KΩ	1	27E393-3	BTA-39K	Voltage Divider	
R43	2.2Ω	½	27E1015-2	BW-½-2.2	Series Filament Wire-Wound	
R44	4700Ω	½	27E472-2	BTS-4700	Peaking Coil Shunt	
R45	56000Ω 5%	½	27E1009-8	BTS-5600-5%	Video Detector Diode Load	See Note 1.
R46	470Ω	½	27E471-2	BTS-470	Video Output Cathode	
R47	3300Ω	½		BTS-3300	Peaking Coil Shunt	
R48	56000Ω 5%	1	27E1009-8	BTA-5600-5%	Video Output Plate	See Note 2.
R49	15KΩ	½	27E1007-5	BTS-15K	Video Output Plate	See Note 3.
R50	270KΩ 20%	½	27E274-2	BTS-270K	Picture Tube Grid	
R51	1.2Meg	½	27E1009-5	BTS-1.2Meg	D.C. Restorer Plate	
R52	270Ω	½	27E271-2	BTS-270	Sound IF Cathode	
R53	33KΩ	1	27E333-3	BTA-33K	Sound IF Decoupling	
R54	270Ω	½	27E271-2	BTS-270	Balancing	
R55	3300Ω 5%	½	27E1009-29	BTS-3300-5%	Balancing	
R56	27000Ω 5%	½	27E1009-28	BTS-2700-5%	Balancing	
R57	6800Ω 5%	½	27E1009-13	BTS-6800-5%	Ratio Detector Diode Load	
R58	6800Ω 5%	½	27E1009-13	BTS-6800-5%	Ratio Detector Diode Load	
R59	39KΩ	½	27E393-2	BTS-39K	De-emphasis	
R60	10Meg 20%	½	27E106-2	BTS-10Meg	Audio Amplifier Grid	
R61	470KΩ 20%	½	27E474-2	BTS-470K	Audio Amplifier Plate	
R62	100KΩ	½	27E104-2	BTS-100K	Audio Amplifier Decoupling	
R63	2.2Meg 20%	½	27E225-2	BTS-2.2Meg	Audio Amplifier Screen	
R64	6.8Ω	1		BW-1-6.8	Audio Amplifier Cathode	
R65	150Ω	½	27E151-2	BTS-150	Audio Feedback	
R66	470KΩ 20%	½	27E474-2	BTS-470K	Audio Output Grid	
R67	470Ω	1	27E471-3	BTA-470	Audio Output Cathode	
R68	2200Ω	½	27E222-2	BTS-2200	Tone Control Shunt	
R69	470Ω	½	27E471-2	BTS-470	Decoupling	
R70	2500Ω	5	27E1016-19	1 3/4A-2500	Voltage Divider Wire-Wound	
R71	2700Ω 5%	½	27E1009-28	BTS-2700-5%	Sync. Seperator Cathode	
R72	3900Ω	½	27E392-2	BTS-3900	Sync. Seperator Plate	
R73	3300Ω 5%	½	27E1009-29	BTS-3300-5%	Sync. Seperator Plate	
R74	15KΩ	½	27E1007-5	BTS-3300	Integrator Network	
R75A	22KΩ			BTS-22K	Integrator Network	
B	8200Ω	½	23E2023-4♦	BTS-8200	Integrator Network	
C	8200Ω			BTS-8200	Integrator Network	
R76	1.2Meg	½	27E1009-5	BTS-1.2Meg	Vertical Oscillator Grid	
R77	470KΩ 20%	½	27E474-2	BTS-470K	Vertical Oscillator Plate	
R78	6800Ω	½	27E682-2	BTS-6800	Vertical Peaking	
R79	4.7Meg	½	27E475-2	BTS-4.7Meg	Feedback Network	
R80	220KΩ 20%	½	27E224-2	BTS-220K	Voltage Divider	
R81	2.2Meg 20%	½	27E225-2	BTS-2.2Meg	Vertical Output Grid	
R82	470Ω	½	27E471-2	BTS-470	Vertical Output Cathode	
R83	2200Ω	½	27E222-2	BTS-2200	VerticalOutput Cathode	
R84	100KΩ 5%	½	27E1009-27	BTS-100K-5%	Phase Detector Diode Load	
R85	100KΩ 5%	½	27E1009-27	BTS-100K 5%	Phase Detector Diode Load	
R86	470K 20%	½	27E474-2	BTS-470K	Phase Detector Diode Load	
R87	100KΩ 20%	½	27E104-2	BTS-100K	AFC Diode Load	
R88	470KΩ 20%	½	27E474-2	BTS-470K	AFC Filter	
R89	27KΩ	½	27E273-2	BTS-27K	Feedback Network	
R90	6800Ω	½	27E682-2	BTS-6800	Feedback Network	
R91	8200Ω 5%	½	27E1009-41	BTS-820-5%	Horizontal MV Cathode	
R92	6800Ω 5%	½	27E1009-13	BTS-6800-5%	Horizontal MV Plate	See Note 4.
R93	82KΩ	½	27E823-2	BTS-82K	Horizontal MV Grid	See Note 5.
R94	47KΩ	½	27E473-2	BTS-47K	Horizontal MV Grid	See Note 3.
R95	330KΩ 5%	½	27E1009-9	BTS-330K-5%	Horizontal MV Plate	
R96	390KΩ 5%	½	27E1009-40	BTS-390K-5%	Horizontal MV Plate	
R97	8200Ω	½	27E1009-15	BTS-8200	Horizontal Peaking	
R98	100Ω	½	27E101-2		Parasitic Suppressor	
R99	560KΩ	½	27E1009-11	BTS-560K	Horizontal Output Grid	
R100	22KΩ	2		BTB-22K	Horizontal Output Screen	See Note 6
R101	22KΩ	2		BTB-22K	Horizontal Output Screen	See Note 3
R102	22KΩ	2		BTB-22K	Horizontal Output Screen	See Note 3
R103	100Ω	½	27E101-2		Parasitic Suppressor	
R104	47KΩ	½	27E473-2	BTS-47K	Filter	
R105	2.2Ω		27E1015-2		HV Rectifier Filament Wire-Wound	
R106	1.2Meg	½	27E1009-5		HV Filter	
R107	5600Ω	½	27E562-2	BTS-5600	Integration	
R108	220KΩ 20%	½	27E224-2	BTS-220K	Picture Tube Cathode	
R109	6800Ω	½	27E682-2	BTS-6800	Voltage Divider	
R110	330KΩ 20%	½	27E334-2	BTS-330K	Line Isolation	
R111	22KΩ 20%	½		BTS-22K	Phase Det. Plate	
R112	47KΩ	½	28E473-2	BTS-47K	Voltage Divider See Note 7	

Note 1: Some models may use a 6800Ω resistor in this application.
Note 2: Some models may use a 3900Ω resistor in this application.
Note 3: Not used in all models.
Note 4: Some models may use a 5600Ω resistor in this application.
Note 5: Some Models may use two Resistors in series to total 82KΩ
Note 6: Some models may use a 75000-5W resistor in this application.
Note 7. Used in Models Employing Electrostatic Focus.
♦ Items C64A, C64B, C64C, R75A, R75B, and R75C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA SENTINEL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @1.65A	500VCT .230ADC	6.3VAC @4.4A	6.3VAC @8.5A	22E66			

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA SENTINEL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	170Ω	960Ω	22E55-2	A-8111 ①	A-3000 ①	TBO-1 ②	Vert. Oscillator Trans.
T3	700Ω tapped @25Ω	14Ω tapped @1.7Ω & 10Ω SEC. 2 0Ω	22E67	A-8130	HVO-7		Horiz. Output Trans.
T4	750Ω tapped @9Ω		22E63	A-8123①	A-3037 ①		Vert. Output Trans.
T5	12Ω 50Ω		30E164-5	DY-8	MDF-70		Horiz. Deflection Coils Vert. Deflection Coils

① Drill one new Mounting Hole
② Drill New Mounting Holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA SENTINEL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T6	6KΩ	3.6Ω	450Ω	.6Ω	22E35-3	A-3878	A-2930	RO-13	

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA SENTINEL PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	P.M.	3.6Ω	1E34-4 ③	ST.-115 Mod. P8-V	8A21	③ Alternate speaker used in models IU-439, 440, and441.
	CONE DIA.	V. C. DIA.	1E34 ③			④ Alternate speaker used in model 438.
SP2	7 7/8 in.	9/16 in.	1E34-2 ③ 1E34-3 ⑤ 1E26-3 ④ 1E49 ④ 1E49-2 ④ 1E43 ⑤ 1E43-2 ⑤ 1E43-3 ⑤			⑤ Alternate speaker used in models 443, 444

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA SENTINEL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.230ADC	95Ω	2.6Henries	22E64	C-2325	C-2991	TR-3300 ①	① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SENTINEL PART No.	MERIT PART No.	IRC PART No.	NOTES
L2	Ant. Trans.	.2Ω	0Ω				
L3	Ant. Coils	0Ω					
L4	Ant. Coils	0Ω					Channels 2 thru 6
L5	RF Grid Coil	0Ω					
L6	RF Plate Coils	0Ω					
L7	Mixer Grid Coils	0Ω					
L8	Osc. Coil	0Ω					Channel 13
L9	Osc. Coils	0Ω					
L10	Fil. Choke	.1Ω					
L11	Fil. Choke	.1Ω		2E78			
L12	RF Choke	1.5Ω					
L13	1st. Video IF	.3Ω					
L14	Video IF Coupling	.2Ω		20E720			
L15	2nd. Video IF	.2Ω		20E360			
L16	3rd. Video IF	.2Ω		20E360			
L17	4th. Video IF	.2Ω		20E360			
L18	Grid Choke	3.6Ω		20E363-8			Wound on 10Meg Resistor
L19	Fil. Choke	1.2Ω		2E92		CLA	1.5 Microhenries
L20	Plate Choke	3.6Ω		20E363-8			Wound on 10Meg Resistor
L21	5th. Video IF	.2Ω		20E725			
L22	Peaking Coil	6.7Ω		20E363-15			Wound on 10Meg Resistor
L23	Peaking Coil	7.4Ω		20E363-16			Wound on 10Meg Resistor
L24	Cath. Choke	1.2Ω		2E92		CLA	1.5 Microhenries
L25	Peaking Coil	11Ω		20E363-14			Wound on 10Meg Resistor
L26	Peaking Coil	16Ω		20E363-13			Wound on 10Meg Resistor
L27	4.5MC Trap	.4Ω		20E721			
L28	Sound IF	2.9Ω		20E361			Tap at 2Ω
L29	Ratio Det. Trans.	3.6Ω	.4Ω	20E684			Tap at .6Ω
L30	Horiz. Osc.	54Ω		20E409			
L31	Width Coil	6.5Ω		20E585	MWC-2		
L32	Horiz. Lin.	17Ω		20E688	MWC-1		

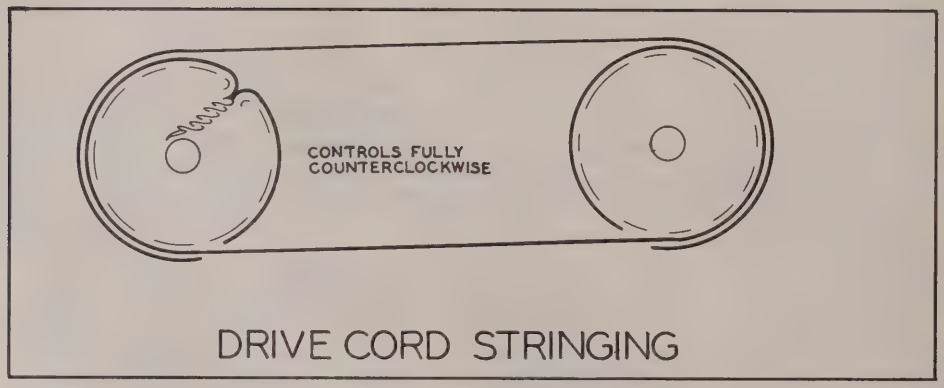
PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

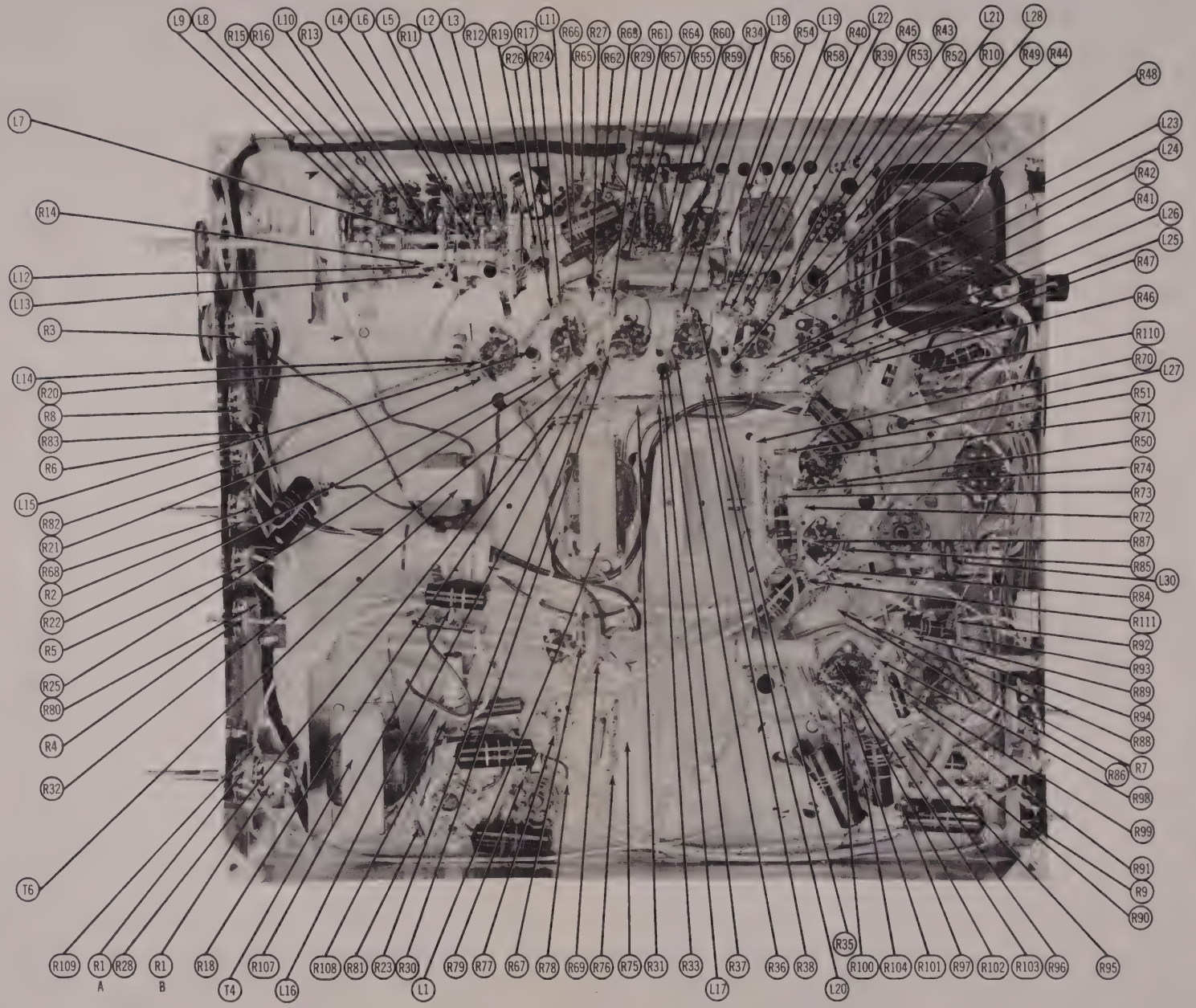
ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			SENTINEL PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M1	3AG	2½A	40E8-9		31302.5	342001	
M2	3AG	2/10 A	40E8-8		313.200	357001	

MISCELLANEOUS

ITEM No.	PART NAME	SENTINEL PART No.	NOTES	
M3A	RF Tuner	20E7H	Complete with tubes.	
B	RF Tuner	20E682	Complete with tubes	(alternate)
M4A	Focus Magnet	62E4		
B	Focus Magnet	62E2-2	Alternate	
M5	Ion Trap	15E174-4		
B2	Trimmer	24E16-2	Horiz. Drive	(130-300MMF)
	Knob	37E71	Brightness	(Mahogany)
	Knob	37E71-3	Brightness	(Blonde)
	Knob	37E71-2	Contrast	(Mahogany)
	Knob	37E71-4	Contrast	(Blonde)
	Knob	37E72	Channel Selector	(Mahogany)
	Knob	37E72-3	Channel Selector	(Blonde)
	Knob	37E72-2	Volume	(Mahogany)
	Knob	37E72-4	Volume	(Blonde)
	Knob	37E73	Tone	(Mahogany)
	Knob	37E73-2	Tone	(Blonde)
	Front Plate Assembly	20E693	(Mahogany)	
	Front Plate Assembly	20E693-2	(Blonde)	



DRIVE CORD STRINGING



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PHOTOFACT* Folder

SILVERTONE MODEL 163-16 (Ch. 478.319)

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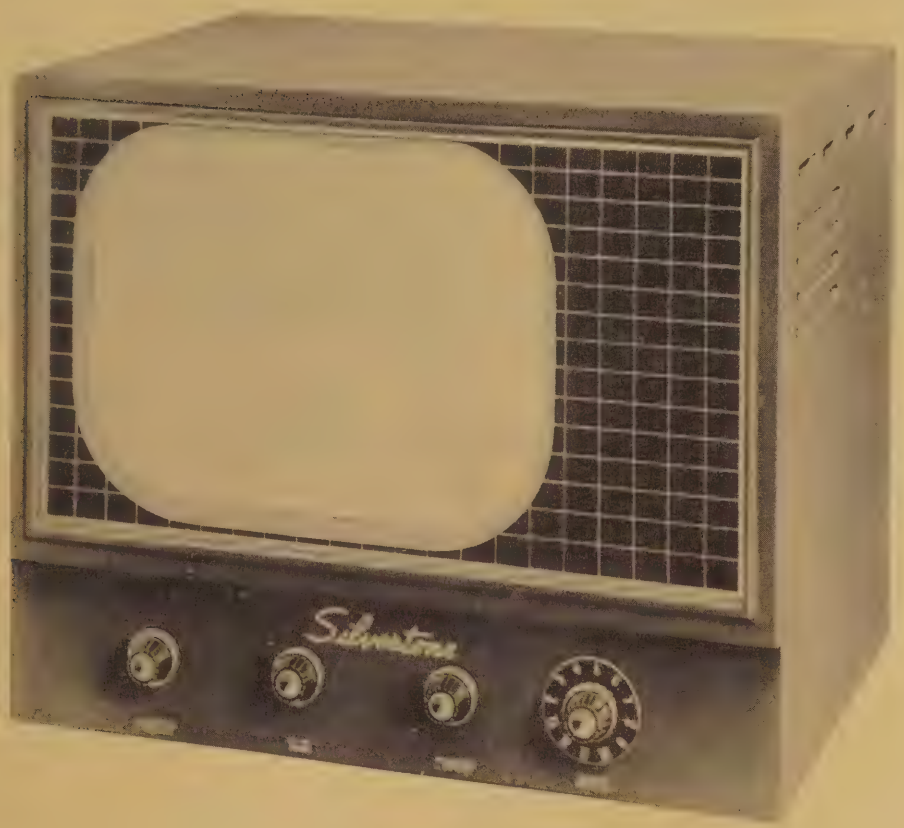

SILVERTONE MODEL 163-16 (Ch. 478.319)

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DATE 1-52 SET 157 FOLDER 10

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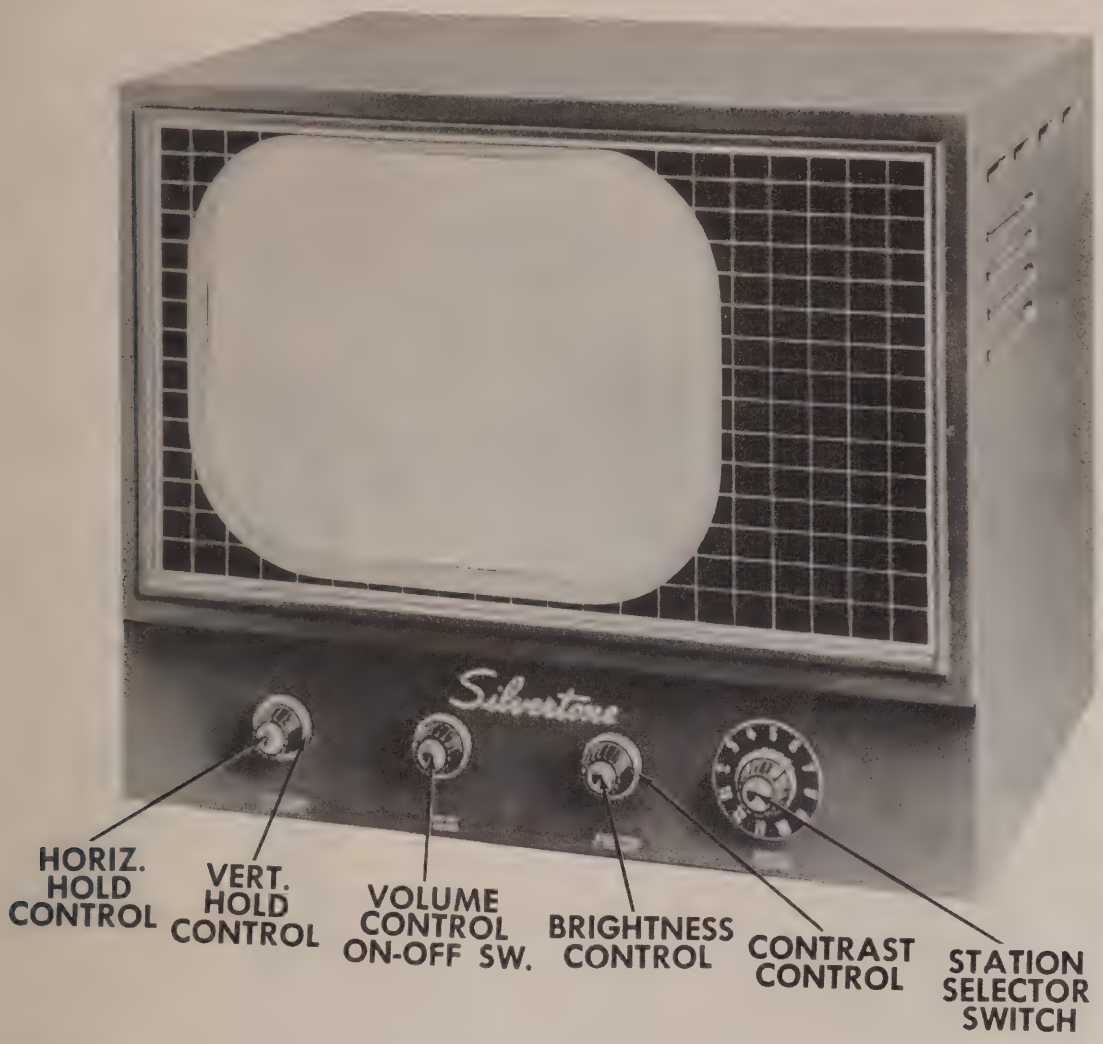

SILVERTONE MODEL 163-16 (Ch. 478.319)

TRADE NAME	Silvertone, Model 163-16 (Chassis 478.319)
MANUFACTURER	Sears Roebuck & Co., 925 S. Homan, Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Twenty One
POWER SUPPLY	110-120 Volts AC - 60 Cycle
RATING	2.1 Amp. @ 117 Volts AC
TUNING RANGE-	Channels 2 thru 13

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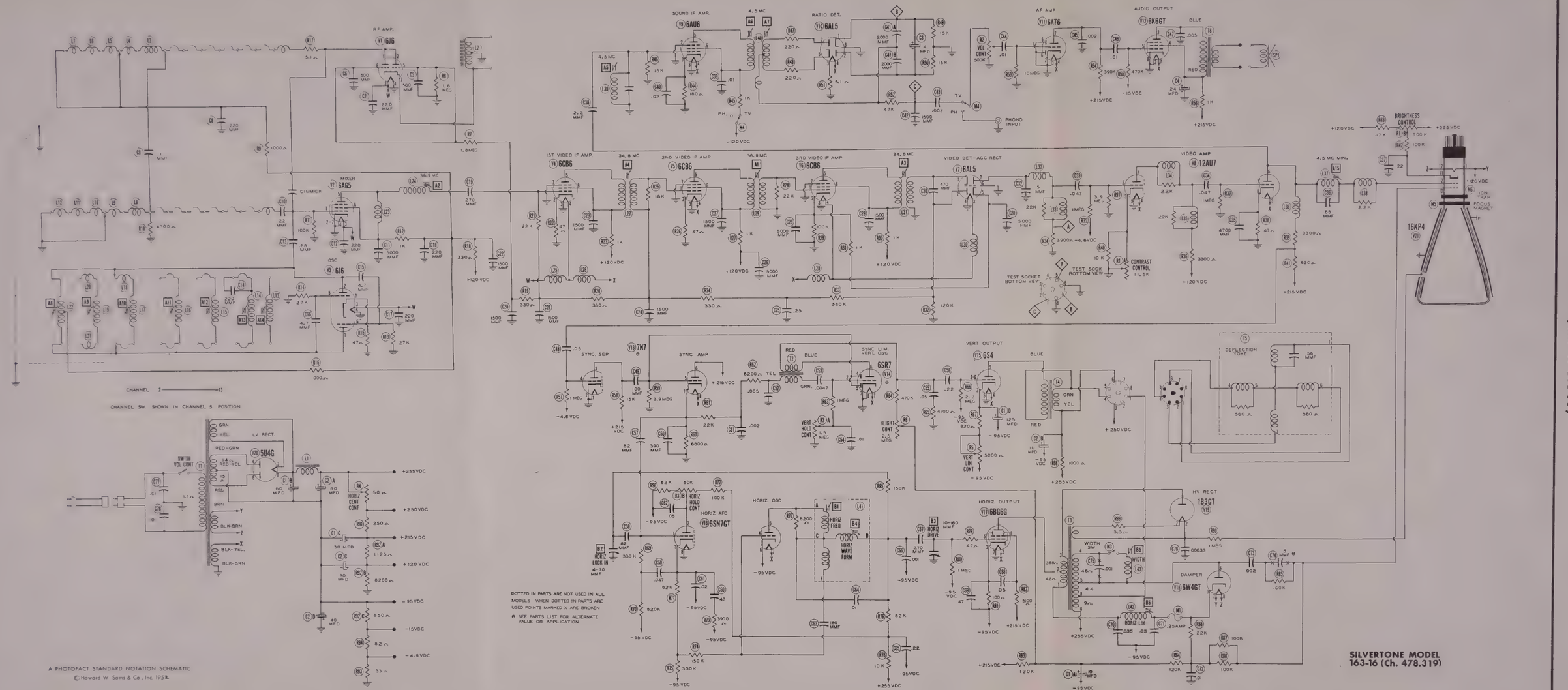
SILVERTONE MODEL
163-16 (Ch. 478.319)
RF AMP.
V1 6J6
MIXER
V2 6AG5
V3 6J6
CHANNEL 2 ——— 13
CHANNEL SW. SHOWN IN CHANNEL 5 POSITION
SOUND IF AMP.
V9 6AU6
4.5 MC
RATIO DET.
V10 6AL5
AF AMP.
V11 6AT6
AUDIO OUTPUT
V12 6K6GT
1ST VIDEO IF AMP.
V4 6CB6
34.8 MC
2ND VIDEO IF AMP.
V5 6CB6
36.9 MC
3RD VIDEO IF AMP.
V6 6CB6
34.8 MC
VIDEO DET.-AGC RECT.
V7 6AL5
VIDEO AMP.
V8 12AU7
4.5 MC MIN.
16KP4
V21
SYNC. SEP.
V13 7N7
SYNC AMP.
SYNC LIM. VERT. OSC.
V14 6SR7
VERT OUTPUT
V15 6S4
HORIZ AFC
V16 6SN7GT
HORIZ. OSC.
HORIZ OUTPUT
V17 6BG6G
HV RECT.
V18 1B3GT
DAMPER
V19 6W4GT
LV RECT.
V20 5U4G
TEST SOCKET BOTTOM VIEW
TEST SOCK BOTTOM VIEW
DOTTED IN PARTS ARE NOT USED IN ALL MODELS WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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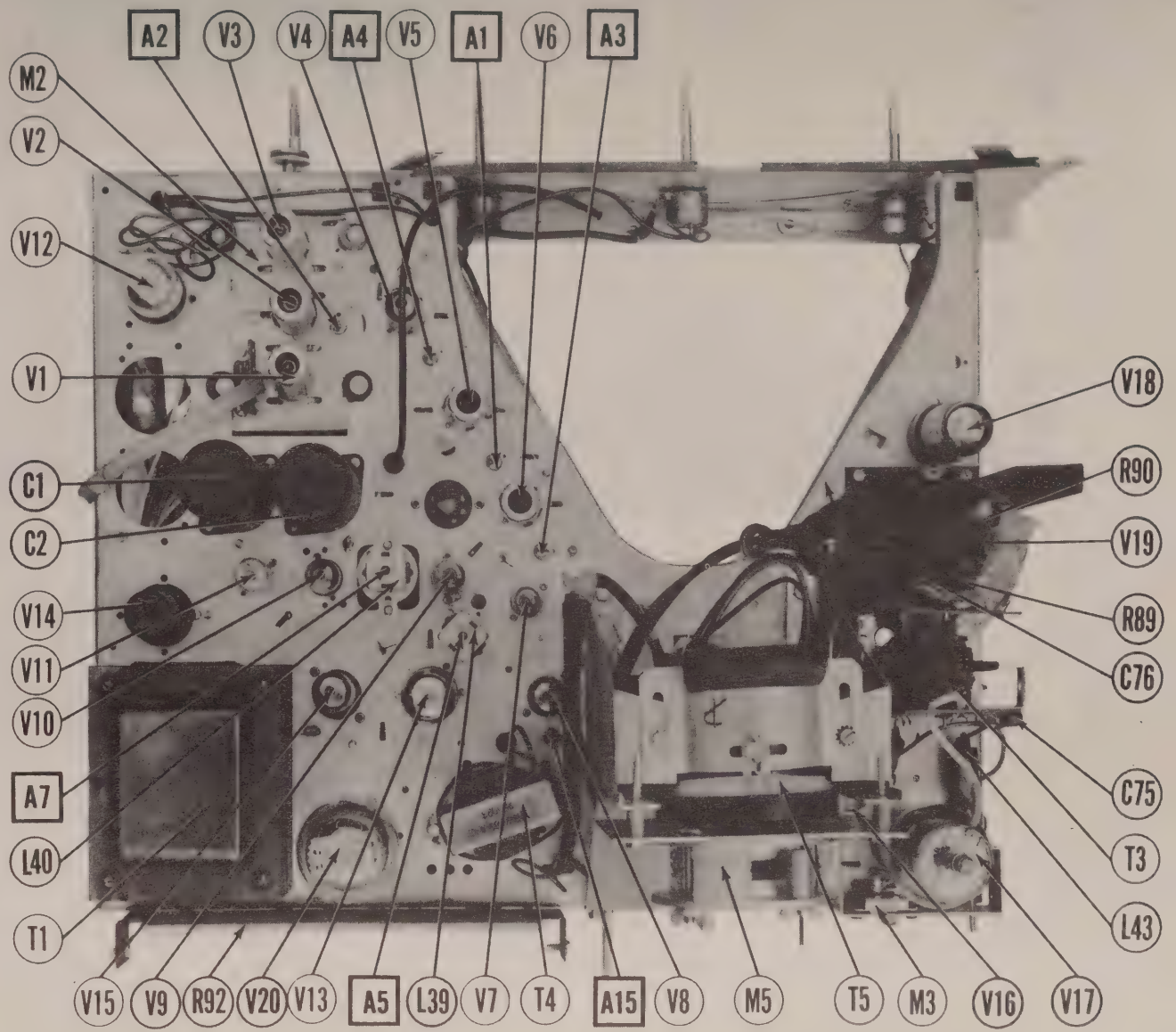
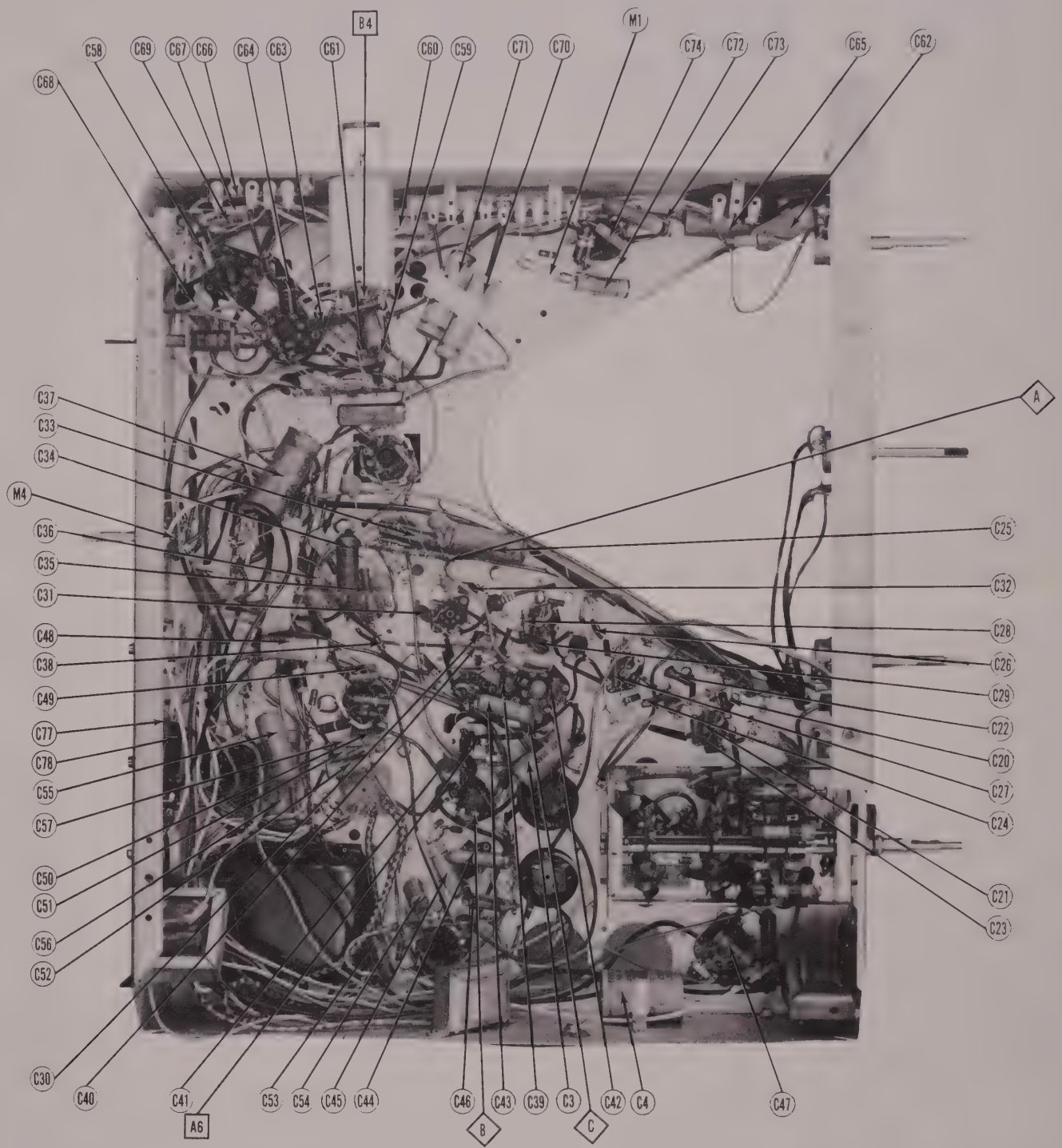
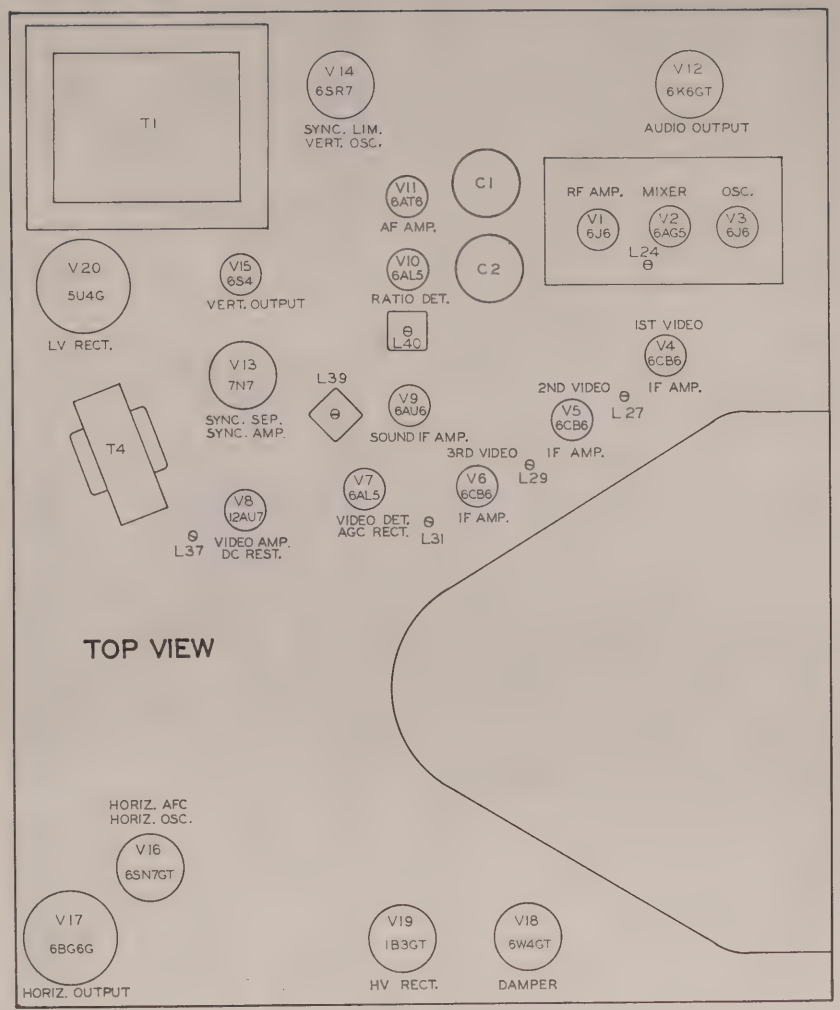
SILVERTONE MODEL
163-16 (Ch. 478.319)

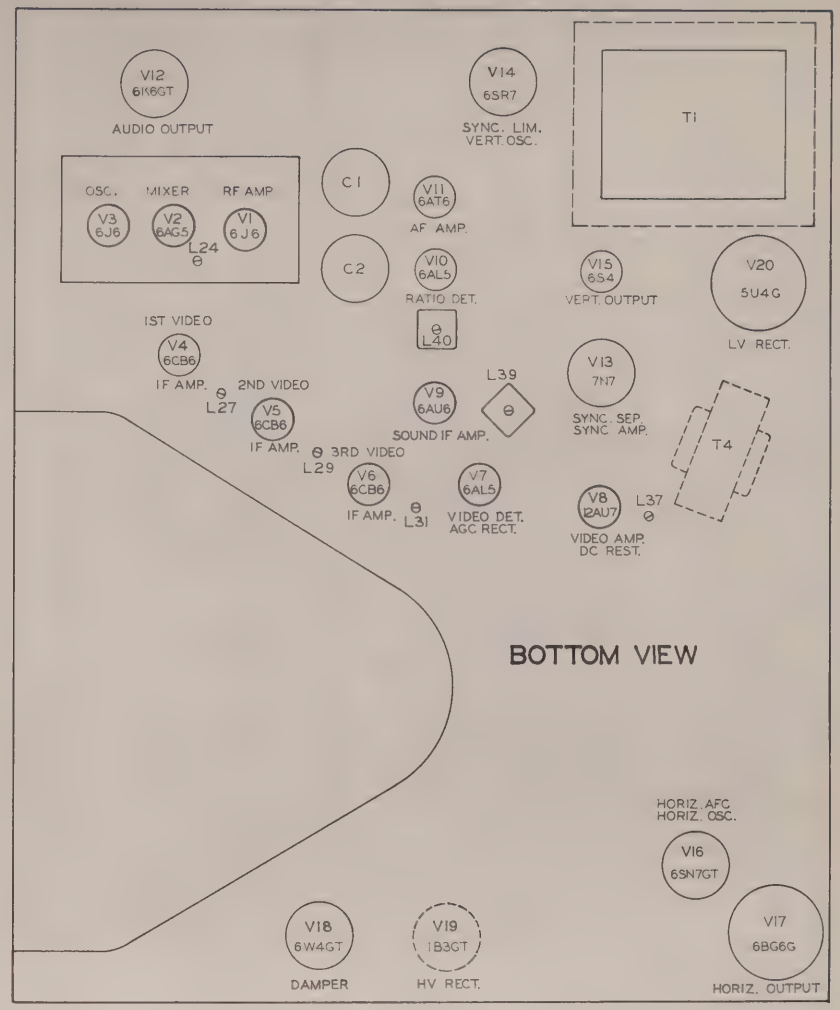


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube, (V16), from its socket.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery to the junction of R33 and C25. Connect the positive lead to chassis.
Remove the local oscillator tube, (V3), to prevent the possibility of erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	36.9MC (Unmod.)	Any	DC probe to Point (A). Common to chassis.	A1, A2	Adjust for maximum deflection.
2.	"	"	34.8MC	"	"	A3, A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Direct	High side to an ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	35MC (10MC SWP)	32.8MC 37.3MC	Any	Vert. amp. to Point (A). Low side to chassis.		Check for response curve similar to figure 1. If necessary retouch A1 thru A4 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to Pin 7 (grid) of 12AU7 (V8). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to Point (B). Common to chassis.	A5, A6	Adjust for maximum deflection.
5.	"	"	"	"	DC probe to Point (C). Common to chassis.	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to Pin 7 (grid) of 12AU7, (V8). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. amp. to Point (B). Low side to chassis.	A5, A6	Disconnect stabilizer capacitor C3. Adjust for maximum amplitude and symmetry as per figure 2.
5.	"	"	"	"	"	Vert. amp. to Point (C). Low side to chassis.	A7	Reconnect capacitor C3. Adjust A7 so 4.5MC occurs at center of crossover lines as per figure 3. SLIGHTLY retouch A6 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Replace the local oscillator tube, (V3), in its socket.
Set the fine tuning control to the mid-position of its range.
The seven oscillator coils are so arranged that channels 3 thru 12 are paired with one variable and two fixed coils. Each pair of channels are adjusted with only one adjustment, therefore only the channels which are available in the area where the set is to operate should be aligned. It should be noted that the channel 2 coil is in parallel with all of the other channel oscillator coils, therefore it is essential that channel 2 be properly aligned before any other channel.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	57MC (10MC SWP)	55.25MC 59.75MC	2	Vert. amp. to Point (A) Low side to chassis.	A8	Adjust to place sound marker as shown in figure 4. The video marker should be at 50%.
			63MC (10MC SWP) 69MC (10MC SWP)	61.25MC 65.75MC 67.25MC 71.75MC	3 or 4		A9	
			79MC (10MC SWP) 85MC (10MC SWP)	77.25MC 81.75MC 83.25MC 87.75MC	5 or 6		A10	
			177MC (10MC SWP) 183MC (10MC SWP)	175.25MC 179.75MC 181.25MC 185.75MC	7 or 8		A11	
			189MC (10MC SWP) 195MC (10MC SWP)	187.25MC 191.75MC 193.25MC 197.75MC	9 or 10		A12	
			201MC (10MC SWP) 207MC (10MC SWP)	199.25MC 203.75MC 205.25MC 209.75MC	11 or 12		A13	
			213MC (10MC SWP)	211.25MC 215.75MC	13		A14	

THE RF PORTION OF THIS TUNER HAS BEEN PRE-SET AT THE FACTORY AND IS VERY STABLE. ALIGNMENT OF THIS PORTION SHOULD NOT BE REQUIRED IN THE FIELD.

4.5 MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to Pin 7 (grid) of 12AU7 (V8). Low side to chassis.	Not used	4.5MC (400∿ Mod.)	Any	Vert. amp. to Pin 2 of picture tube. Low side to chassis.	A15	Adjust for MINIMUM 400∿ indication on scope. After alignment is completed tune in a test pattern and retouch A15 for maximum vertical wedge definition.

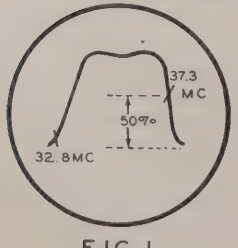


FIG. 1

FIG. 2

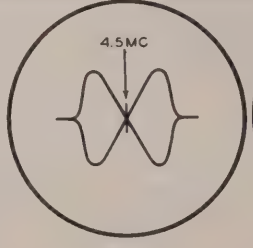


FIG. 3

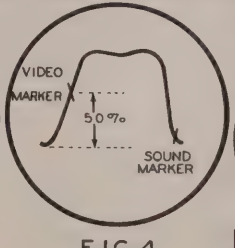
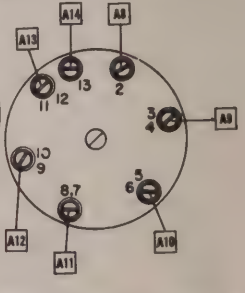
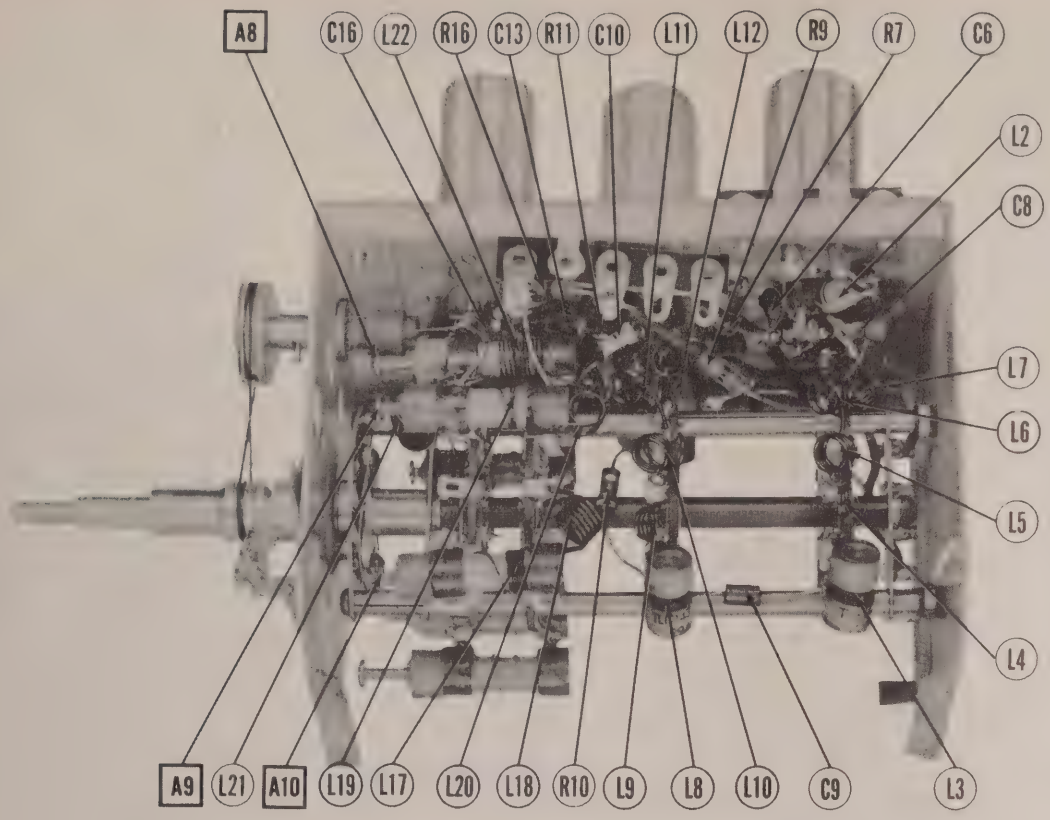


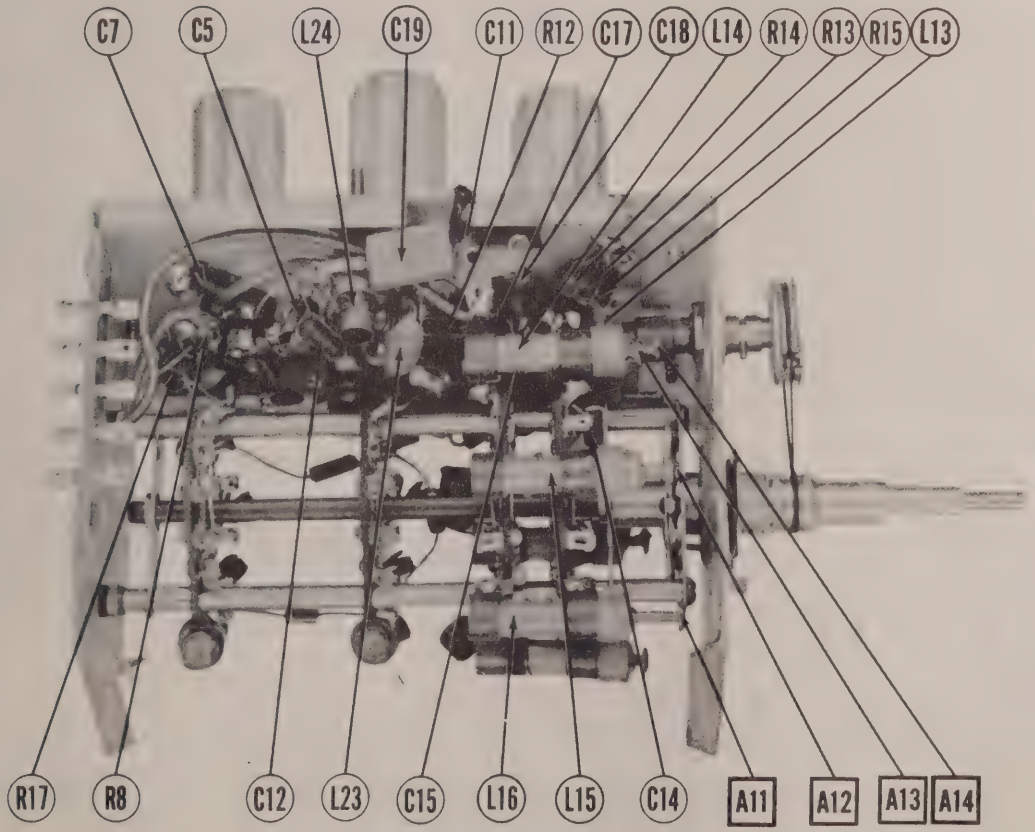
FIG. 4



OSCILLATOR ALIGNMENT POINTS



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	95VDC	95VDC	6.3VAC	0V	.1VDC	.1VDC	0V		
V 2	6AG5	-2VDC	0V	6.3VAC	0V	100VDC	100VDC	0V		
V 3	6J6	95VDC	95VDC	6.3VAC	0V	§-2.7VDC	§-3.9VDC	.4VDC		
V 4	6CB6	-.3VDC	.4VDC	0V	6.3VAC	110VDC	110VDC	0V		
V 5	6CB6	-.2VDC	.4VDC	0V	6.3VAC	110VDC	110VDC	0V		
V 6	6CB6	0V	1.2VDC	0V	6.3VAC	110VDC	110VDC	0V		
V 7	6AL5	0V	-.2VDC	6.3VAC	0V	1.2VDC	0V	-2.5VDC		
V 8	12AU7	117VDC	-.6VDC	3.8VDC	6.3VAC	6.3VAC	140VDC	0V	.8VDC	0V
V 9	6AU6	0V	0V	0V	6.3VAC	112VDC	112VDC	1.3VDC		
V 10	6AL5	.1VDC	-.1VDC	1.2VAC	6.3VAC	-.1VDC	0V	-.1VDC		
V 11	6AT6	-.6VDC	0V	0V	6.3VAC	0V	0V	65VDC		
V 12	6K6GT	215VDC	0V	185VDC	190VDC	-5.2VDC	-15VDC	6.3VAC	0V	
V 13	7N7	0V	0V	135VDC	-.8VDC	-1.8VDC	215VDC	0V	6.3VAC	
V 14	6SR7	0V	-40VDC -5VDC	0V	-1.8VDC	-1.8VDC	230VDC 115VDC	6.3VAC	0V	
V 15	6S4	0V	-80VDC -60VDC	-100VDC -75VDC	6.3VAC	0V	-100VDC -75VDC	0V	0V	240VDC 230VDC
V 16	6SN7GT	-95VDC	12VDC	-105VDC	-135VDC	85VDC	-95VDC	6.3VAC	0V	
V 17	6BG6G	0V	6.3VAC	-90VDC	0V	-110VDC	0V	0V	170VDC	TOP CAP *
V 18	6W4GT	440VDC	0V	460VDC	440VDC	255VDC	0V	120VDC	120VDC	
V 19	1B3GT	* DO NOT MEASURE								
V 20	5U4G	0V	260VDC	0V	-95VDC	0V	-95VDC	0V	260VDC	
V 21	16KP4	120VDC	140VDC	PIN 10 440VDC	PIN 11 250VDC	PIN 12 120VDC				

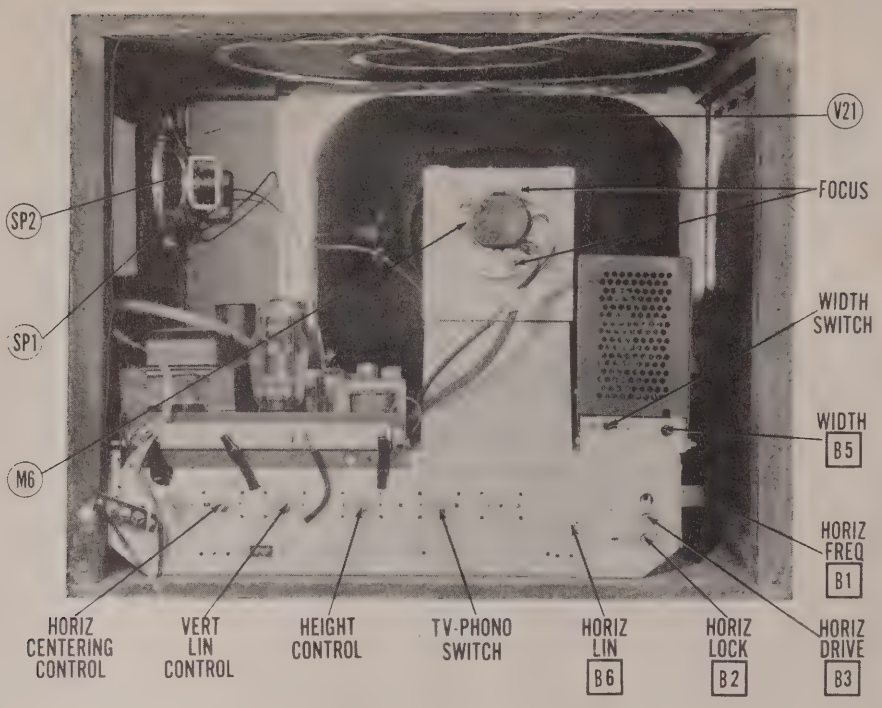
ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED
HORIZONTAL CENTERING CONTROL COUNTER CLOCKWISE
TV-PHONO SWITCH IN TV POSITION
§ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT MEASURE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	†2.8KΩ	†2.8KΩ	.1Ω	0Ω	1.2Meg	1.2Meg	0Ω		
V 2	6AG5	100KΩ	0Ω	.1Ω	0Ω	†2.8KΩ	†2.8KΩ	0Ω		
V 3	6J6	†2.8KΩ	†2.8KΩ	.1Ω	0Ω	27KΩ	27KΩ	47Ω		
V 4	6CB6	700KΩ	47Ω	0Ω	.1Ω	†2.4KΩ	†2.4KΩ	0Ω		
V 5	6CB6	700KΩ	47Ω	0Ω	.1Ω	†2.4KΩ	†2.4KΩ	0Ω		
V 6	6CB6	.2Ω	100Ω	0Ω	.1Ω	†2.4KΩ	†2.4KΩ	0Ω		
V 7	6AL5	.4Ω	120KΩ	.1Ω	0Ω	1.1KΩ	0Ω	3.9KΩ		
V 8	12AU7	†4.7KΩ	1Meg	6KΩ	.1Ω	.1Ω	†4.4KΩ	1Meg	47Ω	0Ω
V 9	6AU6	1Ω	0Ω	0Ω	.1Ω	†2.4KΩ	†2.4KΩ	180Ω		
V 10	6AL5	15KΩ	15KΩ	2.5Ω	.1Ω	Inf.	0Ω	Inf.		
V 11	6AT6	10Meg	0Ω	0Ω	.1Ω	0Ω	0Ω	†390KΩ		
V 12	6K6GT	Inf.	0Ω	†1.7KΩ	†1.3KΩ	470KΩ	115Ω	.1Ω	0Ω	
V 13	7N7	0Ω	0Ω	†15KΩ	1Meg	3.9Meg	†335Ω	6.8KΩ	.1Ω	
V 14	6SR7	0Ω	2.5Meg	0Ω	3.9Meg	3.9Meg	†590KΩ †3Meg	.1Ω	0Ω	
V 15	6S4	Inf.	6.6KΩ 1.1KΩ	2.2Meg	.1Ω	0Ω	2.2Meg	Inf.	Inf.	†1.7KΩ
V 16	6SN7GT	1.5Meg	†65KΩ	410KΩ	480KΩ	†90KΩ	765Ω	.1Ω	0Ω	
V 17	6BG6G	Inf.	.1Ω	865Ω	Inf.	1Meg	Inf.	0Ω	†5.4KΩ	TOP CAP #70Ω
V 18	6W4GT	#170KΩ	Inf.	†260KΩ	#22KΩ	†50Ω	Inf.	8KΩ	8KΩ	
V 19	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #460Ω
V 20	5U4G	Inf.	8KΩ	Inf.	800Ω	Inf.	800Ω	Inf.	8KΩ	
V 21	16KP4	8KΩ	†4.4KΩ	PIN 10 #70KΩ	PIN 11 120KΩ	PIN 12 8KΩ				

ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED
HORIZONTAL CENTERING CONTROL COUNTER CLOCKWISE
TV-PHONO SWITCH IN TV POSITION
† MEASURED FROM PIN 8 OF V20
# MEASURED FROM PIN 3 OF V 18

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

HORIZONTAL OSCILLATOR ALIGNMENT

Connect a short across terminals C and D of L41
Turn the set on and tune in a TV station, preferably a test pattern.
Turn the horizontal lock trimmer, (B2), and the horizontal drive trimmer, (B3) two full turns counter-clockwise from tight.
Adjust the horizontal frequency slug, (B1), until the picture synchronizes horizontally.
Adjust B3 clockwise just enough to remove the bright vertical bars in the picture. If the picture falls out of sync, adjust B1.
Turn the hold control fully counter-clockwise and momentarily interrupt signal.
Turn the hold control slowly clockwise and carefully note the least number of bars present just before the picture falls into sync. If there are less than 7, or more than 9 bars, adjust B2 slightly and repeat the check. Repeat this procedure until 7 to 9 bars are present at pull in.
Turn the hold control to the mid-position of its range and remove the short from L41.
Connect the vertical input of an oscilloscope between terminal C of L41 and chassis.
Adjust the horizontal phase adjustment (B4) until the broad and narrow peaks of the waveform on the oscilloscope are of equal height as shown in figure 5. If necessary during adjustment of B4, turn B1 to keep the picture synchronized.
Remove the oscilloscope and turn the hold control to fully counter-clockwise. Momentarily interrupt the signal by switching to another channel and back again.
Slowly turn the hold control clockwise and carefully note the least number of bars present before the picture synchronizes. If less than 2 1/2 or more than 3 1/2 bars are present adjust B2 slightly and repeat the check until 2 1/2 to 3 1/2 bars are present at the pull-in point. The picture should hold sync over at least 3/4 of the hold control range.

HORIZONTAL LINEARITY ADJUSTMENTS

Adjust the width slug, (B5), until the picture fills the mask horizontally.
Adjust the horizontal linearity slug, (B6), until the picture is symmetrical from left to right.
Since the horizontal drive trimmer (B3) effects both width and horizontal linearity it may be necessary to retouch it for optimum results; however, if B3 is changed a significant amount, recheck the horizontal oscillator alignment.

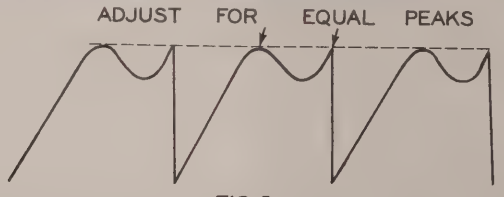
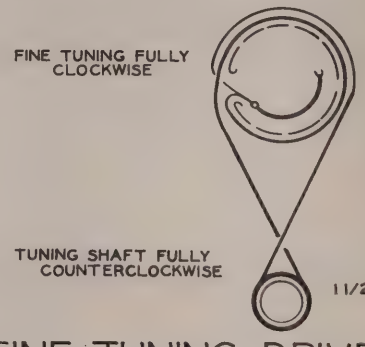


FIG. 5

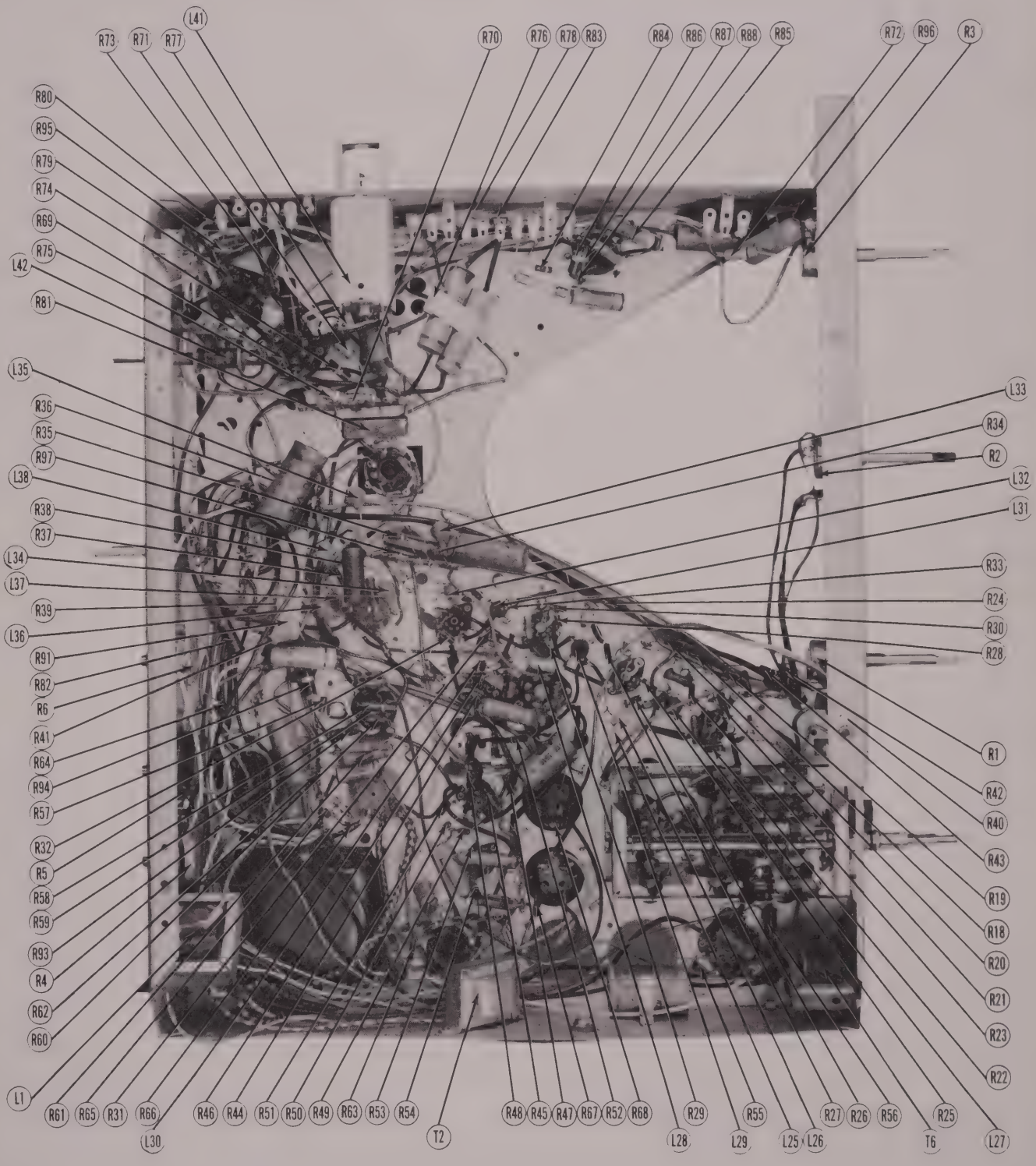
DISASSEMBLY INSTRUCTIONS

1. Remove seven push-on type control knobs.
2. Remove eight wood screws holding rear cover in place. Remove rear cover.
3. Disconnect built-in antenna.
4. Remove antenna terminal strip.
5. Disconnect speaker.
6. Remove four hex head bolts from chassis. Remove chassis.
7. Remove two nuts from speaker. Remove speaker.

NOTE: FOR PICTURE TUBE REMOVAL, IT IS NECESSARY TO REMOVE THE CHASSIS AS OUTLINED ABOVE.



FINE TUNING DRIVE CORD



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No	USE	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	6J6	6J6	7BF	
V2	Mixer	6AG5	6AG5	7BD	
V3	Oscillator	6J6	6J6	7BF	
V4	1st Video IF Amp.	6CB6	6CB6	6CK	
V5	2nd Video IF Amp.	6CB6	6CB6	6CK	
V6	3rd Video IF Amp.	6CB6	6CB6	6CK	
V7	Video Detector - AGC Detector	6AL5	6AL5	6BT	
V8	Video Amp.-DC Restorer	12AU7	12AU7	9A	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Detector	6AL5	6AL5	6BT	
V11	AF Amplifier	6AT6	6AT6	7BT	
V12	Audio Output	6K6GT	6K6GT	7S	
V13A	Sync. Separator - Sync. Amplifier	7N7	7N7	8B	
B	Sync. Separator - Sync. Amplifier	6SN7GT	6SN7GT	8BD	
V14A	Sync. Limiter - Vert. Oscillator	6SR7	6SR7	8Q	
B	Sync. Limiter - Vert. Oscillator	6BF6	6BF6	7BT	
V15	Vert. Output	6S4	6S4	9AC	
V16	Horiz. AFC - Horiz. Oscillator	6SN7GT	6SN7GT	8BD	
V17	Horiz. Output	6DG6G	6BG6G	5BT	
V18	Damper	6W4GT	6W4GT	4CG	
V19	H.V. Rectifier	1B3GT	1B3GT	3C	
V20	L. V. Rectifier	5U4G	5U4G	5T	
V21	Picture Tube	16KP4	16KP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	10	475	TCE147-D	AF2X12Z6125B		UPT413		TVL-4811	▲ Decoupling
B	60	450							■ Filter
C	30	400							▲ Filter
D	125	50							Vertical Output Cathode
C2A	80	450	TCE148-D	AF16J216G8D		UPT412		TVL-4710	▲ Filter
B	10	400							■ Vert. Output Dec.
C	30	300							▲ Filter
D	40	150							Filter
C3	4	35	TCE104-D	PR8150/4		BR550		TVA-1203	Stabilizing Cap
C4	24	350	TCE 112-1-DA	PR5350/24		BR2035A		TVA-1810	Output Dec.
C5	500		TCC501-GM	BPD-00047	DD-471		GP2K-500	19C32	AGC Filter
C6	500		TCC201-GM	BPD-00047	DD-471		GP2K-500	19C32	AGC Filter
C7	220		TCC221-7	SI220	D6-221		GP2K-220	19C13	RF Amp. Fil.
C8	220		TCC221-7	SI220	D6-221		GP2K-220	19C13	RF Amp. Dec.
C9	1		TCC1U0-11		TCZ-1				RF Coupling
C10	22		TCC22-12		TCZ-22		NP0K-22	19C12	RF Coupling
C11	5000		TCC502-SP	BPD-005	DD-502		811-005	29C1	Mixer Decoupling
C12	220		TCC221-7	SI220	D6-221		GP2K-220	19C13	Mixer Filament
C13	.68		TCC068-8		TCZ-.68				Osc. Coupling
C14	220		TCC221-7	SI220	D6-221		GP2K-220	19C13	RF Bypass
C15	4.7		TCC4.7-11	SI5N750			N750K-5		Osc. Feedback
C16	4.7		TCC4.7-11	SI5N750			N750K-5		Osc. Feedback
C17	220		TCC221-7	SI220	D6-221		GP2K-220	19C13	Osc. Filament
C18	220		TCC221-7	SI220	D6-221		GP2K-220	19C13	RF Bypass
C19	270	500	TCM271-7	1468-00025	D6-271	5W5T2S	GP2K-270	1FM-325	IF Coupling
C20	1500		TCC153-SP	SI1500	D6-152	1W5D15	GP2L-0015	29C8	AGC Filter
C21	1500		TCC152-SP	SI1500	D6-152	1W5D15	GP2L-0015	29C8	AGC Filter
C22	1500		TCC152-SP	SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C23	1500		TCC152-SP	SI1500	D6-152	1W5D15	GP2L-0015	29C8	1st V. IF Dec.
C24	1500		TCC153-SP	SI1500	D6-152	1W5D15	GP2L-0015	29C8	AGC Filter
C25	.25	200	TCP254-1	P488-25		GT2P25		2TM-P25	AGC Filter
C26	5000		TCC502-SP	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C27	1500		TCC152-SP	SI1500	D6-152	1W5D15	GP2L-0015	29C8	2nd V. IF Dec.
C28	1500		TCC152-SP	SI1500	D6-152	1W5D15	GP2L-0015	29C8	3rd V. IF Dec.
C29	5000		TCC502-SP	BPD-005	DD-502	1D5D5	811-005	29C1	3rd V. IF Cathode
C30	470		TCC471-10	BPD-00047	DD-471	5W5T5	GP2K-470	19C15	IF Coupling
C31	5000		TCC502-SP	BPD-005	DD-502	1D5D5	811-005	29C1	DAGC Dec.
C32	5	500	TCC050-8	1468-000005	TCZ-4.7	5W5T5	GP1K-5	MS-55	V. Diode Filter
C33	.047	200	TCPM503-1	P288-047	DF-503	PTE4S5		2TM-S47	Video Coupling
C34	.047	200	TCPM503-4	P288-047	DF-503	PTE4S5		2TM-S47	Video Coupling
C35	4700		TCP502-4	SI4700	D6-472	1D5D6	GP2M-0047	29C20	V. Amp. Cathode
C36	68				TCZ-68		NP0M-68	36C9	Fixed Trimmer
C37	.22	600	TCPM254-4	684-25		GT6P25		6TM-P25	Pic. Tube Cathode
C38	2.2		TCC2.2-7		TCZ-2.2				S. IF Coupling
C39	.01	400	TCP103-4	P488-01	D6-103	PTE4S1	821-01	4TM-S1	S. IF Decoupling
C40	.02	200	TCP203-1	P488-02	DF-203	PTE4S2		2TM-S2	S. IF Cathode
C41 A	2000		TCC3-1	BPD-2X002	DD-2-203	1W5D2	812-2X002	29C5	Diode Load Cap
B	2000					1W5D2			Diode Load Cap
C42	1500		TCC153-SP	SI1500	D6-152	1W5D15	GP2L-0015	29C8	De-emphasis
C43	.002	600	TCP202-10	P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	Audio Coupling
C44	.01	400	TCP103-4	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Audio Coupling
C45	.002	600	TCP202-10	P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	De-emphasis
C46	.01	400	TCP103-4	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Audio Coupling
C47	.005	600	TCPM502-10	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Output Plate
C48	.05	600	TCPM503-4	P688-05	DF-503	PTE6S5		6TM-S5	Sync. Coupling
C49	100	500	TCM01-8	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Sync. Coupling
C50	390	500	TCM391-7	1468-0004	D6-391	5W5T4	GP2K-390	1FM-34	Sync. Amp. Cathode
C51	.002	600	TCPM202-10	P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	Integrator Net
C52	.005	600	TCPM502-10	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Integrator Net
C53	.0047	600	TCPM502-11-SP	P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-D47	Vertical Osc. Grid
C54	.01	400	TCPM103-10	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Vertical Osc. Grid
C55	.05	600	TCPM503-10	P688-05	DF-503	PTE6S5		6TM-S5	Vertical Discharge
C56	.22	600	TCPM254-10	684-25		GT6P25		6TM-P25	Vertical Sweep Coupling
C57	82	500	TCM082-8	1469-0001	TCZ-82	5R5T1	GP1K-82	MS-31	Horiz. Sync. Coupling
C58	82	500	TCM082-8	1469-0001	TCZ-82	5R5T1	GP1K-82	MS-31	Horiz. Feedback

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C59	.047	600	TCPM503-4	P688-047	DF-503	PTE6S5		6TM-S47	AFC Filter
C60	.47	200	TCPM474-1	P288-47		GT2P5		2TM-P47	AFC Filter
C61	.02	400	TCPM203-4	P488-02	DF-203	PTE4S2		4TM-S2	AFC Filter
C62	.05	600	TCPM503-10	P688-05	DF-503	PTE6S5		6TM-S5	Horiz. AFC Plate
C63	180	1000	TCSM181-29	1469-HV-0002					Horiz. Osc. Grid
C64	.01	600	TCPM103-10	P688-01		PTE6S1		6TM-S1	Fixed Trimmer
C65	.22	600	TCPM254-10	684-25		GT6P25		6TM-P25	Decoupling
C66	.001	1000	TCPM102-14-SP	P1088-001		PTE16D1		MB-D1	Horiz. Discharge
C67	270	500	TCM271-7	1469-00025	D6-271	5R5T2S	GP2K-270	MS-325	Horiz. Sweep Coupling
C68	.05	600	TCPM503-11	P688-05	DF-503	PTE6S5		6TM-S5	Horiz. Output Screen
C69	.47	200	TCPM474-1	P288-47		GT2P5		2TM-P47	Horiz. Output Cathode
C70	.035	1000	TCPM353-13	P1088-0033					Damper Filter
C71	.05	1000	TCP503-13	P1088-05		PTE16S5		MB-S5	Damper Filter
C72	.01	600	TCPM103-10	P688-01	D6-103	PTE6S1	821-01	6TM-S1	Decoupling
C73	.002	600	TCPM202-10	P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	Horiz. Sweep Coupling
C74	5	1500	TCM050-20	1469-HV-0000 .05					Horiz. Sweep Coupling *
C75	.001	1000	TCPM-102-14-SP	P1088-001		PTE16D1		MB-D1	Fixed Trimmer
C76	.00033	12500							H.V. Filter
C77	.01	400	TCPM103-4-SP	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Line Filter
C78	.01	400	TCPM103-4-SP	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Line Filter

* Not used in all models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	11.5KΩ	½	TVC-524-D		RTV-62	SBB-641	Contrast Control - Front
B	500KΩ	½					Brightness Control - Rear
R2A	500KΩ	½	TVC-526-D	Q13-133	AG-60-Z	B-60-S	Volume Control
B	Shaft		Not req.	Not req.	FS-3	Not req.	Attach to R2A Per Instructions
C	Switch		Not req.	76-1 (Concentrikit)	SWB	Not req.	Attach to R2A Per Instructions
R3A	1.5Meg	½		Bil-138 *			Vertical Hold Control - Front
B	50KΩ	½	TVC-523-D	Bil-123 *	RTV-63		Horizontal Hold Control - Rear
C	Shaft End			E-187 *			Attach Per Instructions in "Concentrikit"
R4	50Ω	2	TVC-542-D	W-50 #	43-50 #	VK-116	Horizontal Centering Control Wire-Wound †
R5A	5000Ω	½	TVC-503-1-D	Q11-114	AM-19-S	AN-10	Vertical Linearity Control
B	Shaft		Not req.	RQ	FKS-1/4	AK-1	Attach to R5A Per Instructions
R6A	2.5Meg	½	TVC-504-1D	Q11-239	AM-84-S	AN-83	Height Control
B	Shaft		Not req.	RQ	FKS-1/4	AK-1	Attach to R6A Per Instructions

* Additional parts to be used with "Concentrikit".
# Fashion shaft to duplicate original.
Note: Some models employing a focus coil use A2250Ω focus control PT.#TVC506-1D
† Not used in all models.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE SPECIFIED
R7	1.8Meg 20%	½	TRC-185-1	BTS-1.8Meg	AGC Network
R8	1.8Meg 20%	½	TRC-185-1	BTS-1.8Meg	RF Amp. Grid
R9	1000Ω 20%	½	TRC-102-1	BTS-1000	RF Amp. Decoupling
R10	4700Ω 5%	½	TRC-472-3	BTS-4700-5%	Mixer Grid Coil Shunt
R11	100KΩ 20%	½	TRC-104-1	BTS-100K	Mixer Grid
R12	1000Ω 20%	½	TRC-102-1	BTS-1000	Mixer Decoupling
R13	27KΩ 20%	½	TRC-273-1	BTS-27K	Osc. Grid
R14	27KΩ 20%	½	TRC-273-1	BTS-27K	Osc. Grid
R15	47Ω 20%	½	TRC-470-1		Osc. Cathode
R16	1000Ω 20%	½	TRC-102-1	BTS-1000	Osc. Plate
R17	5.1Ω	½	TRC-51A-2		Parasitic Suppressor
R18	330Ω 20%	½	TRC-331-1	BTS-330	Decoupling
R19	330Ω 20%	½	TRC-331-1	BTS-330	AGC Network
R20	330Ω 20%	½	TRC-331-1	BTS-330	AGC Network
R21	22KΩ	½	TRC-223-2		1st Video IF Amp. Grid
R22	47Ω 20%	½	TRC-470-1		1st Video IF Amp. Cathode
R23	1000Ω 20%	½	TRC-102-1	BTS-1000	1st Video IF Amp. Decoupling
R24	330Ω 20%	½	TRC-331-1	BTS-330	AGC Network
R25	18KΩ	½	TRC-183-2	BTS-18K	2nd Video IF Transformer Shunt
R26	47Ω 20%	½	TRC-470-1		2nd Video IF Amp. Cathode
R27	1000Ω 20%	½	TRC-102-1	BTS-1000	2nd Video IF Amp. Decoupling
R28	22KΩ	½	TRC-223-2		3rd Video IF Transformer Shunt
R29	100Ω 20%	½	TRC-101-1	BTS-100	3rd Video IF Amp. Cathode
R30	1000Ω 20%	½	TRC-102-1	BTS-1000	3rd Video IF Amp. Decoupling
R31	1000Ω	½	TRC-102-2	BTS-1000	AGC Det. Diode Load
R32	120KΩ 20%	½	TRC-124-1	BTS-120K	AGC Det. Diode Load
R33	560KΩ	½	TRC-564-2	BTS-560K	AGC Network
R34	3900Ω	½	TRC-392-2	BTS-3900	Video Det. Diode Load
R35	1Meg	½	TRC-105-2	BTS-1Meg	Video Amp. Grid
R36	3300Ω	1	TRC-332-5	BTA-3300	Video Amp. Plate
R37	1Meg 20%	½	TRC-105-1	BTS-1Meg	Video Amp. Grid
R38	47Ω 20%	½	TRC-470-1		Video Amp. Cathode
R39	3300Ω	1	TRC-332-5	BTA-3300	Video Amp. Plate
R40	10KΩ 20%	½	TRC-103-1	BTS-10K	Contrast Control Shunt
R41	820Ω	½	TRC-821-2	BTS-820	Video Amp. Decoupling
R42	100KΩ	½	TRC-104-2	BTS-100K	Picture Tube Cathode
R43	47KΩ 20%	½	TRC-473-1	BTS-47K	Voltage Divider
R44	180Ω	½	TRC-181-2	BTS-180	Sound IF Amp. Cathode
R45	1000Ω	½	TRC-102-2	BTS-1000	Sound IF Amp. Decoupling
R46	15KΩ	½	TRC-153-2		Sound IF Transformer Shunt
R47	220Ω	½	TRC-221-1	BTS-220	Balancing
R48	220Ω	½	TRC-221-1	BTS-220	Balancing
R49	15KΩ	½	TRC-153-3	BTS-15K	Ratio Det. Diode Load
R50	15KΩ	½	TRC-153-3	BTS-15K	Ratio Det. Diode Load
R51	5.1Ω	½	TRC-51A-1	BW-½-5.1	Ratio Det. Diode Filament
R52	47KΩ	½	TRC-473-1	BTS-47K	De-emphasis
R53	10Meg	½	TRC-106-1	BTS-10Meg	AF Amp. Grid
R54	390KΩ	½	TRC-394-2	BTS-390K	AF Amp. Plate
R55	470KΩ	½	TRC-474-1	BTS-470K	Output Grid
R56	1000Ω	2	TRC-102-8	BTB-1090	Output Decoupling
R57	1Meg 20%	½	TRC-105-1	BTS-1Meg	Sync. Sep. Grid
R58	15KΩ	1	TRC-153-5	BTA-15K	Sync. Sep. Plate
R59	3.9Meg 20%	½	TRC-395-1	BTS-3.9Meg	Sync. Amp. Grid

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	IDENTIFICATION CODES
R60	6800Ω 20%	½	TRC-682-1	BTS-6800	Sync. Amp. Cathode
R61	22KΩ 20%	½	TRC-223-1	BTS-22K	Integrator
R62	82000Ω 20%	½	TRC-823-1	BTS-8200	Integrator
R63	1Meg	½	TRC-105-2	BTS-1Meg	Vert. Osc. Grid
R64	470KΩ	½	TRC-474-2	BTS-470K	Vertical Osc. Plate
R65	4700Ω 5%	½	TRC-472-3	BTS-4700-5%	Vertical Peaking
R66	2.2Meg	½	TRC-225-2	BTS-2.2Meg	Vertical Output Grid
R67	820Ω	½	TRC-821-2	BTS-820	Vertical Output Cathode
R68	1000Ω	½	TRC-102-2	BTS-1000	Vertical Output Decoupling
R69	330KΩ	½	TRC-334-2	BTS-330K	Horizontal AFC Grid
R70	820KΩ	½	TRC-824-2	BTS-820K	Horizontal AFC Grid
R71	82KΩ 5%	1	TRC-823-6	BTA-82K-5%	Horizontal AFC Cathode
R72	100KΩ 5%	1	TRC-104-6	BTA-100K-5%	Horizontal AFC Plate
R73	3900Ω	½	TRC-392-2	BTS-3900	Horizontal AFC Filter
R74	150KΩ 5%	1	TRC-154-6	BTA-150K-5%	Horizontal Osc. Grid
R75	330KΩ 5%	1	TRC-334-6	BTA-330K-5%	Bias Network
R76	82KΩ 5%	1	TRC-823-6	BTA-82K-5%	Horizontal Osc. Plate
R77	8200Ω	½	TRC-822-2	BTS-8200	Horizontal Osc. Coil Shunt
R78	10KΩ 20%	½	TRC-103-1	BTS-10K	Decoupling
R79	47Ω 20%	½	TRC-470-1		Parasitic Suppressor
R80	1Meg 20%	½	TRC-105-1	BTS-1Meg	Horizontal Output Grid
R81	100Ω	2	TRC-101-8	BW-2-100	Horizontal Output Cathode - Wire Wound
R82	5100Ω 5%	2			Horizontal Output Screen
R83	120KΩ 20%	½	TRC-124-1	BTS-120K	Decoupling
R84	120KΩ 20%	½	TRC-124-1	BTS-120K	Decoupling
R85	100KΩ	2	TRC-104-7	BTS-100K	Damper Filter
R86	100KΩ	1	TRC-104-5	BTA-100K	Acc. Anode Load
R87	100KΩ	½	TRC-104-5	BTA-100K	Acc. Anode Load
R88	22KΩ 20%	½	TRC-223-1	BTS-22K	Damper Load
R89	3.3Ω	½	TRC-3.3A-1		HV Rectifier Filament
R90	1Meg 20%	2	TRC-105-4		HV Filter
R91	250Ω	10	TRW-251-SP	1 3/4A-250	Filter - Wire Wound
R92A	1125Ω	9.8	TRP-17-DA		Voltage Divider - Wire Wound
B	8200Ω	2.3			Voltage Divider - Wire Wound
C	650Ω	10.1			Voltage Divider - Wire Wound
R93	33Ω	1	TRC-330-5	BW-1-33	Voltage Divider
R94	82Ω	2	TRC-820-8	BW-2-82	Voltage Divider
R95	150KΩ	½	TRC-154-2	BTS-150K	Horizontal Feedback
R96	82KΩ	1	TRC-823-5	BTA-82K	Voltage Divider

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ 2.1A	720VCT .250ADC	5VAC @ 3A	6.3VAC @ 1.8A SEC. 4 6.3VAC @ 7A	TTR188-D	P8159 and P5014 ①		TP-360

① Mount beneath chassis.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	67Ω	101Ω	TTR161-3	A-8111	A-3000	T80-1	Vertical Block Osc. Trans
T3	430Ω Tap 42Ω	18Ω Taps 9Ω and 13.4Ω SEC. 2 0Ω	TTR209-D		HV0-6		Horizontal Output Trans.
T4	690Ω	8.4Ω	TR2189-D	A-8112	A-3036	T80-5 ②	Vertical Output Trans.
T5A	11Ω		TTR223-D	DY-7	MDF-70		Horizontal Deflection Coil
B	63Ω						Vertical Deflection Coil

② Drill one new mounting hole.
Note: Some models use a focus coil PT.# TLF 522-1-D

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T6	5000Ω	4Ω	390Ω	.4Ω	TTR-179D	A-3877	A-2930	R0-8	

SPEAKER

ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: SILVERTONE PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	3Ω	4Ω	TSP464	534	5A15	
	CONE DIA.	V. C. DIA.				
SP2	4"X6"	9/16"				

PARTS LIST CONTINUED ON PAGE 15

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.260A	37Ω	1 Henry	TTR160-2D	C-2326 ②	C-2996 ②	TR-3300②	② Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	SILVERTONE PART No.	MERIT PART No.	
L2	Ant. Coil	0Ω		TLF565-D		
L3	RF Coil	0Ω		TLF143-D		Channel 6
L4	RF Coil	0Ω		TLF130-D		Channel 5
L5	RF Coil	0Ω		TLF129-D		Channel 4
L6	RF Coil	0Ω		TLF129-D		Channel 3
L7	RF Coil	0Ω		TLF126-D		Channel 2
L8	Mixer Grid Coil	0Ω		TLF143-D		Channel 6
L9	Mixer Grid Coil	0Ω		TLF130-D		Channel 5
L10	Mixer Grid Coil	0Ω		TLF129-D		Channel 4
L11	Mixer Grid Coil	0Ω		TLF129-D		Channel 3
L12	Mixer Grid Coil	0Ω		TLF128-D		Channel 2
L13	Osc. Coil	0Ω		TLF120-10		Channel 13
L14	Osc. Coil	0Ω		TLF120-10		Channel 11 and 12
L15	Osc. Coil	0Ω		TLF120-9		Channel 9 and 10
L16	Osc. Coil	0Ω		TLF120-6		Channel 7 and 8
L17	Osc. Coil	0Ω		TLF120-5		Channel 5 and 6
L18	Incremental Coil	0Ω		TLF541-D		Channel 5
L19	Osc. Coil	0Ω		TLF120-3		Channel 3 and 4
L20	Incremental Coil	0Ω		TLF542-D		Channel 3
L21	Incremental Coil	0Ω		TLF542-D		Channel 3
L22	Osc. Coil	0Ω		TLF120-1		Channel 2
L23	RF Choke	2.8Ω		TLF146-D		
L24	1st Video IF	.8Ω		TLF551-D		
L25	Fil. Choke	0Ω		TLF520-D		
L26	Fil. Choke	0Ω		TLF520-D		
L27	2nd Video IF	.4Ω	.4Ω	TLF567-D		
L28	Fil. Choke	0Ω		TLF520-D		
L29	3rd Video IF	.2Ω	.2Ω	TLF568-D		
L30	Fil. Choke	0Ω		TLF520-D		
L31	4th Video IF	.4Ω	.4Ω	TLF567-1D		
L32	Peaking Coil	2.8Ω		TLF146-D		15 Microhenries
L33	Peaking Coil	6.8Ω		TLF135-D		180 Microhenries - Wound on 22KΩ Resistor (Green Dot)
L34	Peaking Coil	6.8Ω		TLF135-D		180 Microhenries - Wound on 22KΩ Resistor (Green Dot)
L35	Peaking Coil	6.8Ω		TLF135-D		180 Microhenries - Wound on 22KΩ Resistor (Green Dot)
L36	Peaking Coil	9.6Ω		TLF562-D		350 Microhenries (Red Dot)
L37	4.5MC Trap	1.4Ω		TLF570-D		
L38	Peaking Coil	5.5Ω		TLF502-D		120 Microhenries - Wound on 22KΩ Resistor (Blue Dot)
L39	Sound IF	1Ω		TLF114-D		
L40	Ratio Det. Trans.	5.5Ω	2Ω	TLF531-D		
L41	Horiz. Osc. Trans.	85Ω	54Ω	TLF566-D		
L42	Horiz. Lin Coil	28Ω		TLF533-D		
L43	Width Coil	34Ω		TLF506-DA		

① Parallel with 22KΩ Resistor.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			SILVERTONE PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M1	3AG PigTail	.025			318.250		

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M2	RF Tuner		
M3	Switch	TSW-201	Width
M4	Switch		TV-Phono
M5	Focus Magnet	TPM101DA	
M6	Ion Trap		
B2, B3	Trimmer	TAS541-D	Dual (Horizontal Lock 4-70MMF) Horizontal Drive 10-160MMF)
	Knob	TKN117-D	Channel Selector
	Knob	TKN116-D	Dual
	Knob	TKN115-D	Inside
	Knob	TKN114-D	Outside
	Escutcheon	TMS121-R	
	Safety Glass	TGL120-D	
	Mask	TMS973-D	

PHOTOFACT* Folder

SPARTON MODELS 4964, 4965, 5064, 5065, (Ch. 23TB10)

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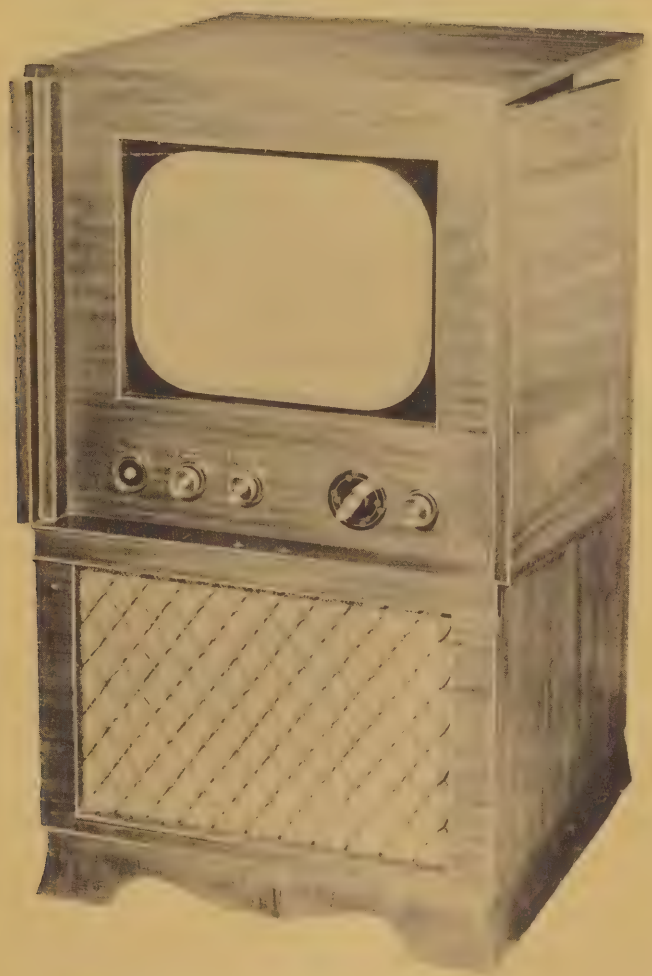

MODEL 5064

SPARTON MODELS 4964, 4965, 5064, 5065, (Ch. 23TB10)

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SPARTON MODELS 4964, 4965, 5064, 5065, (Ch. 23TB10)

SPARTON 5064

TRADE NAME	Sparton Models 4964, 4965, 5064, 5065, (Chassis 23TB10)
MANUFACTURER	Sparks-Withington Co. Jackson, Mich.
TYPE SET	Television Receiver
TUBES	Twenty Seven
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	2 Amp. @ 117 Volts AC
TUNING RANGE—	Channels 2 thru 13

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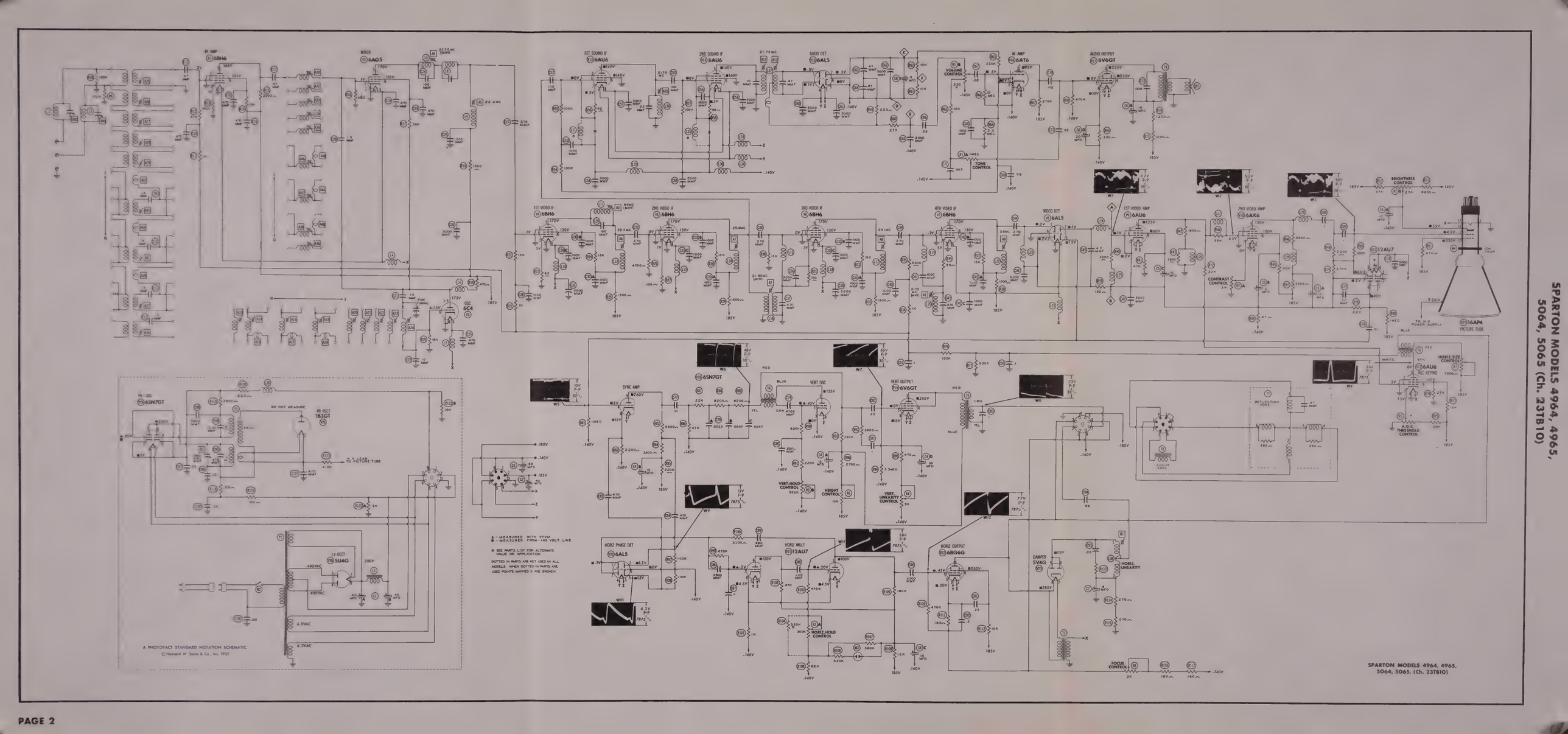
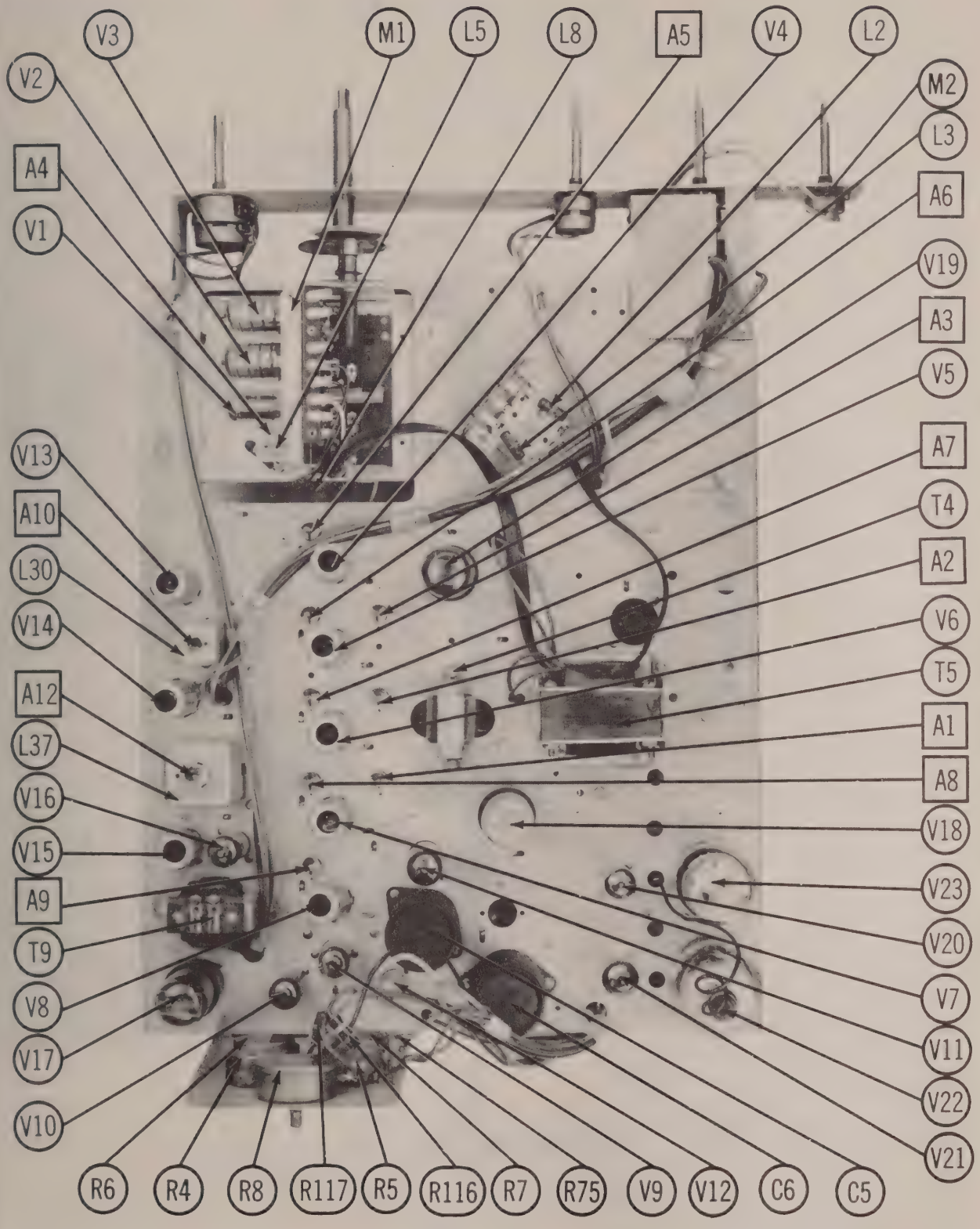
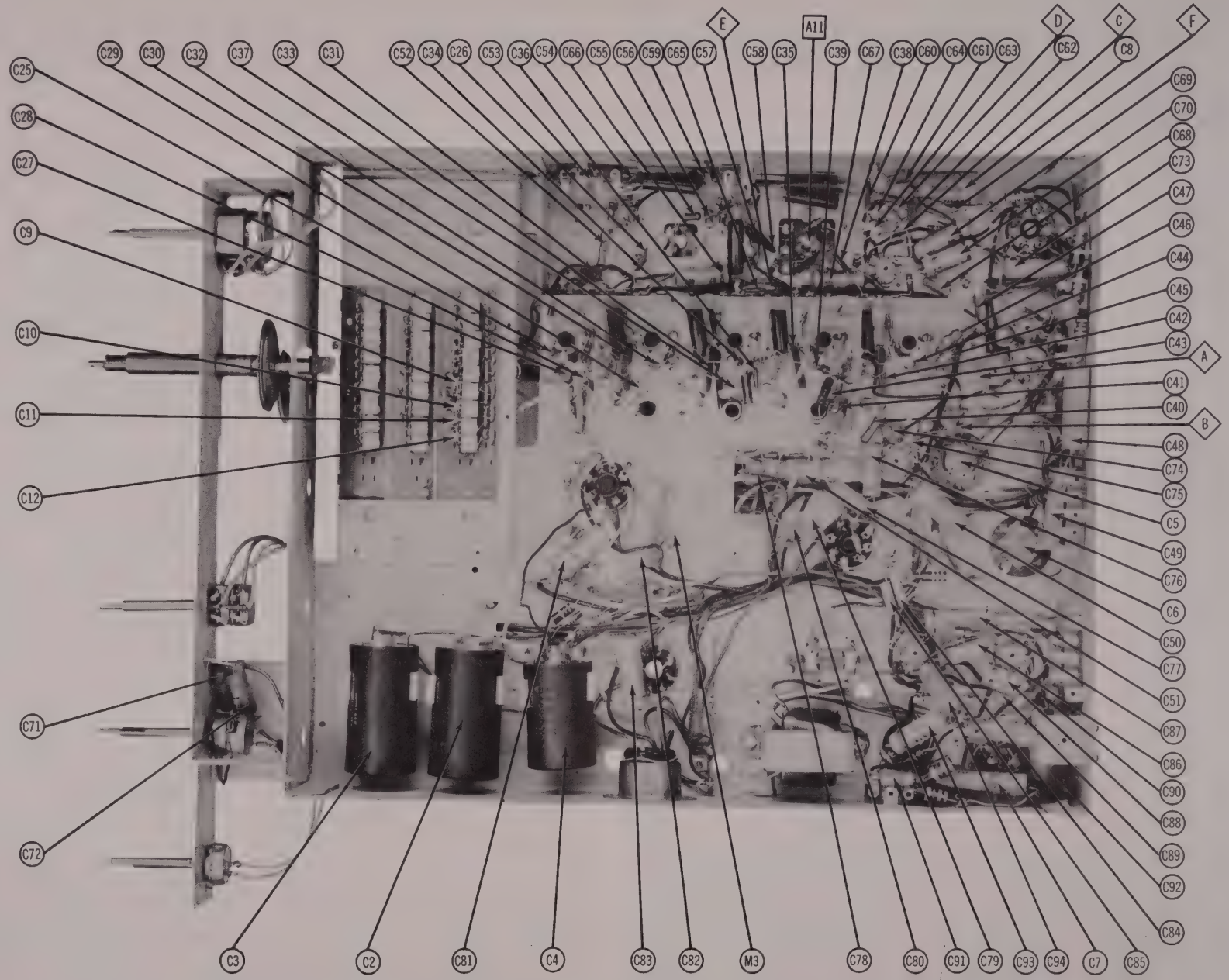
SPARTON MODELS 4964, 4965, 5064, 5065, (Ch. 23TB10)


SPARTON MODELS 4964, 4965, 5064, 5065 (Ch. 23TB10)
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1952
A - MEASURED WITH VTVM
B - MEASURED FROM -140 VOLT LINE
DOTTED IN PARTS ARE NOT USED IN ALL MODELS WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
DO NOT MEASURE
HV RECT 1B3GT/9
H. V. LEAD TO PICTURE TUBE
LV RECT 5U4G
400VAC
6.3VAC
VOLUME CONTROL
TONE CONTROL
VERT. HOLD CONTROL
HEIGHT CONTROL
VERT. LINEARITY CONTROL
HORIZ. HOLD CONTROL
HORIZ. LINEARITY
HORIZ. SIZE CONTROL
BRIGHTNESS CONTROL
CONTRAST CONTROL
A.G.C. THRESHOLD CONTROL
A.G.C. KEYING
FOCUS CONTROL
DEFLECTION YOKE
ION TRAP
16AP4 PICTURE TUBE
TO H.V. POWER SUPPLY
SPARTON MODELS 4964, 4965, 5064, 5065, (Ch. 23TB10)



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

BOTTOM VIEW

TOP VIEW

TUBE PLACEMENT CHART

SPARTON MODELS 4964, 4965, 5064, 5065 (Ch. 23TB10)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the high voltage oscillator tube, (V24), from its socket.

VIDEO IF ALIGNMENT

To prevent the possibility of erroneous indication, remove the oscillator tube, (V3), from its socket.
During video IF alignment the common lead of the VTVM is connected to approximately 120 volts with respect to chassis.
Avoid touching or grounding the VTVM case.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over mixer tube, (V2). Low side to chassis.	21.75MC unmod.	Any	DC probe to point (A). Common to point (B).	A1, A2	Adjust for MINIMUM deflection
2.	"	"	27.75MC	"	"	A3, A4	"
3.	"	"	22.4MC	"	"	A5	Adjust for maximum deflection.
4.	"	"	22.5MC	"	"	A6	"
5.	"	"	25.9MC	"	"	A7	"
6.	"	"	24.1MC	"	"	A8	"
7.	"	"	26MC	"	"	A9	"

OVERALL VIDEO IF RESPONSE CHECK

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to an ungrounded tube shield floating over mixer tube, (V2). Low side to chassis.	24MC (10MC swp.)	21.75MC 22.7MC 25.5MC 26.25MC 27.75MC	Any	Vert. amp. to Point (A). Low side to chassis.		Check for response curve similar to Fig. 1. If necessary retouch A5 thru A9 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

During sound IF alignment the common lead of the VTVM is connected to approximately 120 volts with respect to chassis.
Avoid touching or grounding the VTVM case.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.01MFD	High side to pin 1, (grid) of 6AU6, (V13). Low side to chassis.	21.75MC (unmod)	Any	DC probe to point (C). Common to point (D).	A10, A11	Adjust for maximum deflection.
10.	"	"	"	"	DC probe to point (E). Common to point (F).	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.01MFD	High side to Pin 1, (Grid), of 6AU6, (V13). Low side to chassis.	21.75MC (450KC swp)	21.75MC	Any	Vert. amp. to Point (C). Low side to chassis.	A10, A11	Disconnect stabilizor capacitor C8. Adjust for maximum amplitude and symmetry as per Fig. 2.
10.	"	"	"	"	"	Vert. amp. to Point (E). Low side to chassis.	A12	Adjust A12 so 21.75MC occurs at center of crossover lines as per Fig. 3. SLIGHTLY retouch A11 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

It is necessary that the sound IF channel be accurately aligned before oscillator alignment is attempted.
Since small inductances are connected in series with the tuned circuits for channels 8, 10, and 12 to form the tuned circuits for channels 7, 9 and 11, the order of alignment is important. It is necessary to align the higher channel of each pair, (7and 8, 9 and 10, 11 and 12) first.
Replace the local oscillator tube in its socket.
The coil slugs are held in place with wax which should be removed when aligning the individual coils. The wax should be replaced after the slug is adjusted .
Set the fine tuning control to the mid-position of its range.
The signal generator output lead should be terminated with its characteristic impedance, usually 50Ω.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	215.75MC (unmod)	13	DC probe to point (E). Common to point (F).	A13	Adjust or zero reading. A positive and negative reading will be obtained on either side of the correct setting.
12.	"	"	209.75MC	12	"	A14	"
13.	"	"	203.75MC	11	"	A15	Mechanically distort coil for zero reading,as in step 11.
14.	"	"	197.75MC	10	"	A16	Adjust for zero reading.
15.	"	"	191.75MC	9	"	A17	Mechanically distort coil for zero reading.
16.	"	"	185.75MC	8	"	A18	Adjust for zero reading.
17.	"	"	179.75MC	7	"	A19	Mechanically distort coil for zero reading.
18.	"	"	87.75MC	6	"	A20	Adjustfor zero reading.
19.	"	"	81.75MC	5	"	A21	"
20.	"	"	71.75MC	4	"	A22	"
21.	"	"	65.75MC	3	"	A23	"
22.	"	"	59.75MC	2	"	A24	"

ALIGNMENT INSTRUCTIONS (CONT.)

RF ALIGNMENT

In the event complete alignment of the RF and mixer circuits is necessary, it is recommended that the complete tuner be returned to the factory for a replacement unit. If only one or two channels require adjustments, alignment of those channels may be performed.
Short the AGC line to chassis while aligning the RF circuits .
Keep signal generator output as low as possible and still give a reading.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
23	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	59.75MC	2	DC probe to Point E. Common to Point F.		Adjust fine tuning control for zero reading.
24	"	"	"	"	Across Cap. C8.	A25	Adjust for maximum deflection.
25.	"	"	65.75MC	"	DC probe to Point E. Common to Point F.		Adjust fine tuning control for zero reading.
26.	"	"	"	3	Across Cap. C8.	A26	Adjust for maximum deflection.
27.	"	"	71.75MC	4	DC probe to Point E. Common to Point F.		Adjust fine tuning control for maximum deflection.
28.	"	"	"	"	Across cap. C8.	A27	Adjust for maximum deflection.
29.	"	"	81.75MC	5	DC probe to Point E. Common to Point F.		Adjust fine tuning control for zero reading.
30.	"	"	"	"	Across cap. C8.	A28	Adjust for maximum deflection.
31.	"	"	87.75MC	6	DC probe to Point E. Common to Point F.		Adjust fine tuning control for zero reading.
32.	"	"	"	"	Across cap. C8.	A29	Adjust for maximum deflection.
33.	"	"	55.25MC	2	DC probe to Point A. Common to Point B.	A30	Adjust fine tuning control, and A30 for maximum deflection.
34.	"	"	61.25MC	3	"	A31	Adjust fine tuning control and A31 for maximum deflection.
35.	"	"	67.25MC	4	"	A32	Adjust fine tuning control and A32 for maximum deflection.
36.	"	"	77.25MC	5	"	A33	Adjust fine tuning control and A33 for max. deflection.
37.	"	"	83.25MC	6	"	A34	Adjust fine tuning control and A34 for max. deflection.
38.	"	"	213MC	13	"	A35, A36	Adjust fine tuning control A35 and A36 for max. deflection.
39.	"	"	207MC	12	"	A37, A38	Adjust fine tuning control, A37, and A38 for max. deflection.
40.	"	"	201MC	11	"	A39, A40	Adjust fine tuning control and mechanically distort A39 and A40 for maximum deflection.
41.	"	"	1.95MC	10	"	A41, A42	Adjust fine tuning control, A41 and A42 for maximum deflection.
42.	"	"	1.89MC	9	"	A43, A44	Adjust fine tuning control, Mechanically distort A43 and A44 for maximum deflection .
43.	"	"	183MC	8	"	A45, A46	Adjust fine tuning control, A45 and A46 for maximum deflection.
44.	"	"	177MC	7	"	A47, A48	Adjust fine tuning control, and mechanically distort A47 and A48 for maximum deflection.

WAVE TRAP ADJUSTMENTS

Wave traps A49 and A50 are used to reject IF interference. Their adjustment will depend upon the type of interference encountered. With the receiver on the channel being interfered with , adjust the fine tuning control until the interference with either sound or picture, or both is at a maximum. Adjust A49 and A50 to minimize the interference. The trimmer screws should be kept at approximately the same relative position. Do not turn either screw more than ½ turn before adjusting the other screw.

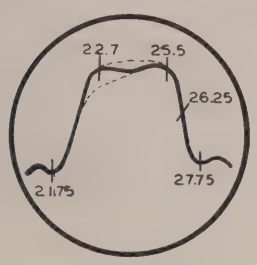


FIG. 1

FIG. 2

FIG. 3

RESISTANCE MEASUREMENTS

RESISTANCE READINGS

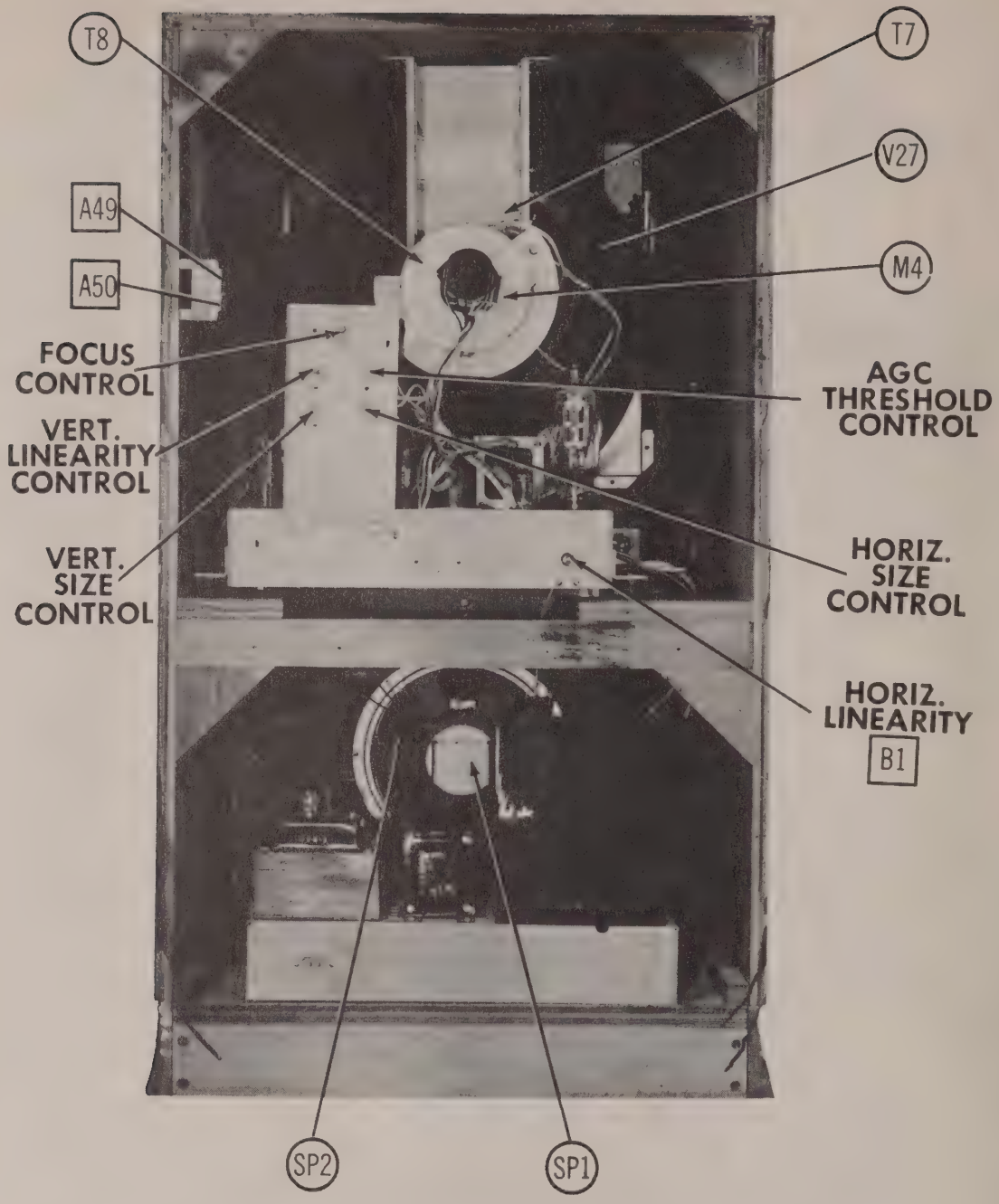
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BH6	475KΩ	100Ω	0Ω	.2Ω	†2.2KΩ	†15KΩ	0Ω		
V 2	6AG5	1Meg	0Ω	0Ω	.2Ω	†1.5KΩ	†56KΩ	0Ω		
V 3	6C4	†540Ω	Inf.	.2Ω	0Ω	†540Ω	1■KΩ	0Ω		
V 4	6BH6	450KΩ	68Ω	0Ω	.2Ω	†1.5KΩ	†16KΩ	0Ω		
V 5	6BH6	4.7KΩ	100Ω	0Ω	.2Ω	†1.5KΩ	†16KΩ	0Ω		
V 6	6BH6	1.5Ω	100Ω	0Ω	.2Ω	†1.5KΩ	†16KΩ	0Ω		
V 7	6BH6	430KΩ	68Ω	0Ω	.2Ω	†1.5KΩ	†16KΩ	0Ω		
V 8	6AL5	■200Ω	■200Ω	0Ω	.2Ω	■1Meg	0Ω	■3.3KΩ		
V 9	6AU6	■3.3KΩ	■47Ω	■.1Ω	■0.	1.8KΩ	47KΩ	■47Ω		
V 10	6AK6	1.8KΩ	0Ω	0Ω	.1Ω	†9.1KΩ	†100KΩ	2.2Ω		
V 11	12AU7	Inf.	Inf	Inf.	■.1Ω	■.1Ω	■22KΩ	■47Ω	■270KΩ	■0Ω
V 12	6AU6	24KΩ	0Ω	.1Ω	0Ω	100KΩ	†9.5KΩ	1KΩ		
V 13	6AU6	■440KΩ	■0Ω	■.1Ω	■.3Ω	.4Ω	0Ω	■82Ω		
V 14	6AU6	■100KΩ	■0Ω	■.1Ω	■.3Ω	.5Ω	0Ω	■68Ω		
V 15	6AL5	Inf.	Inf.	■.1Ω	■0Ω	■0Ω	■0Ω	■20KΩ		
V 16	6AT6	■10Meg	■0Ω	■.1Ω	■0Ω	■240KΩ	■240KΩ	†270KΩ		
V 17	6V6GT	0Ω	■0Ω	†2.8KΩ	†2.4KΩ	■470KΩ	Inf.	■.1Ω	■330Ω	
V 18	6SN7GT	■1.3Meg	†330KΩ	■0Ω	■1Meg	†12KΩ	■2.2KΩ	■0Ω	■.1Ω	
V 19	6V6GT	0Ω	■.1Ω	†4.8KΩ	†4.8KΩ	■3.3Meg	■0Ω	■0Ω	■700Ω	
V 20	6AL5	Inf.	Inf.	■.1Ω	■0Ω	■100KΩ	■0Ω	■100KΩ		
V 21	12AU7	†190KΩ	■760KΩ	■1KΩ	■0Ω	■0Ω	†60KΩ	Inf.	■1KΩ	■.1Ω
V 22	6BG6G	Inf.	■.1Ω	■400Ω	†10KΩ	■470KΩ	Inf.	■0Ω	†10KΩ	TOP CAP †1.8KΩ
V 23	5V4G	Inf.	†1.8KΩ	Inf.	540Ω	600Ω	540Ω	Inf.	†1.8KΩ	
V 24	6SN7GT	■4.1KΩ	†250Ω	■220Ω	■4.1KΩ	†250Ω.	■220Ω	■0Ω	■.1Ω	
V 25	1B3GT	PINS 1 THROUGH 8 HAVE INF RESISTANCE								TOP CAP † 950Ω
V 26	5U4G	Inf.	4KΩ	Inf.	■300Ω	Inf.	■300Ω	Inf.	4KΩ	
V 27	16AP4	0Ω	■370KΩ	PIN 10 †540Ω	PIN 11 ■12KΩ	PIN 12 .1Ω				

ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PIN 8 OF V26
■ MEASURED FROM -140VDC LINE

DISASSEMBLY INSTRUCTIONS

1. Remove 9 push-on control knobs.
2. Remove 4 screws from rear cover. Remove cover.
3. Disconnect antenna.
4. Disconnect picture tube socket.
5. Disconnect yoke plug.
6. Disconnect power supply plug.
7. Disconnect plug to Off-On switch.
8. Remove 2 main chassis bolts. Remove chassis.
9. Remove 2 power supply chassis bolts. Remove power supply.
10. Remove 4 speaker nuts. Remove speaker.

Note: For picture tube removal it is necessary to remove chassis as outlined above.



CABINET–REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the horizontal hold control to synchronize the picture horizontally.

Adjust the width control until the picture is slightly wider than necessary to fill the mask horizontally.

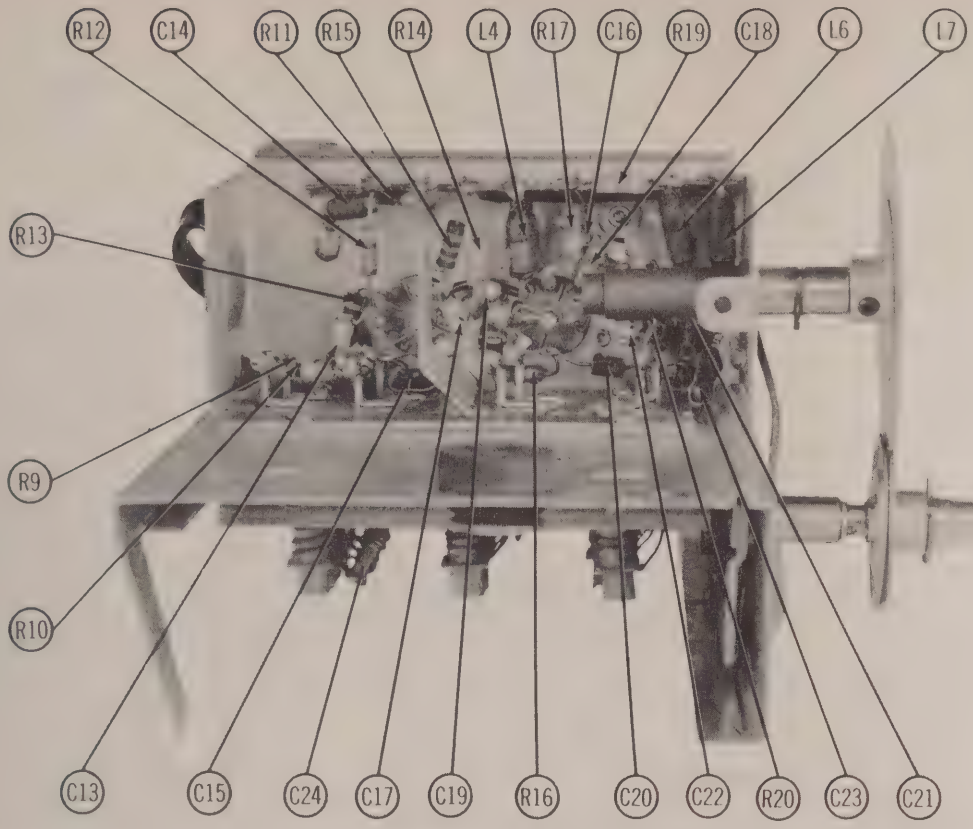
Adjust the horizontal linearity slug, (B1), until the picture is symmetrical from left to right.

AGC THRESHOLD ADJUSTMENT
Turn the contrast control to maximum.

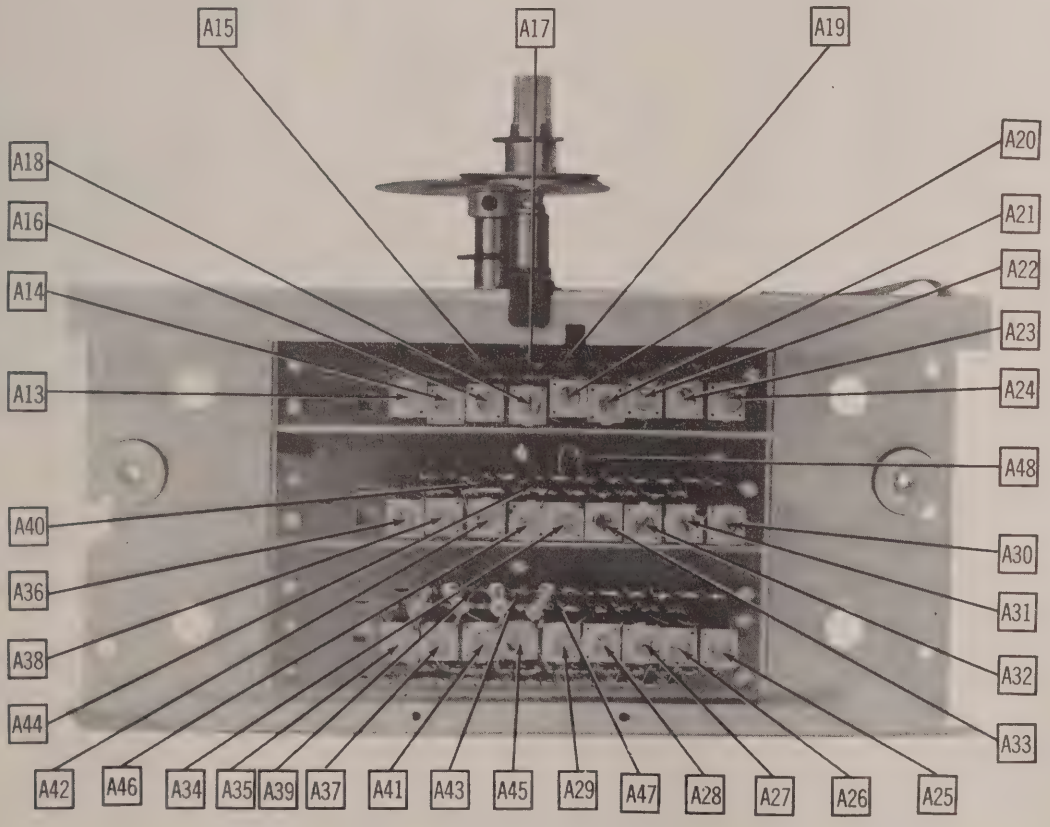
Adjust the AGC threshold control for a picture with slightly more than normal contrast.

HIGH VOLTAGE OSCILLATOR ADJUSTMENT
Connect the probe of a kilovolt meter to the high voltage lead.

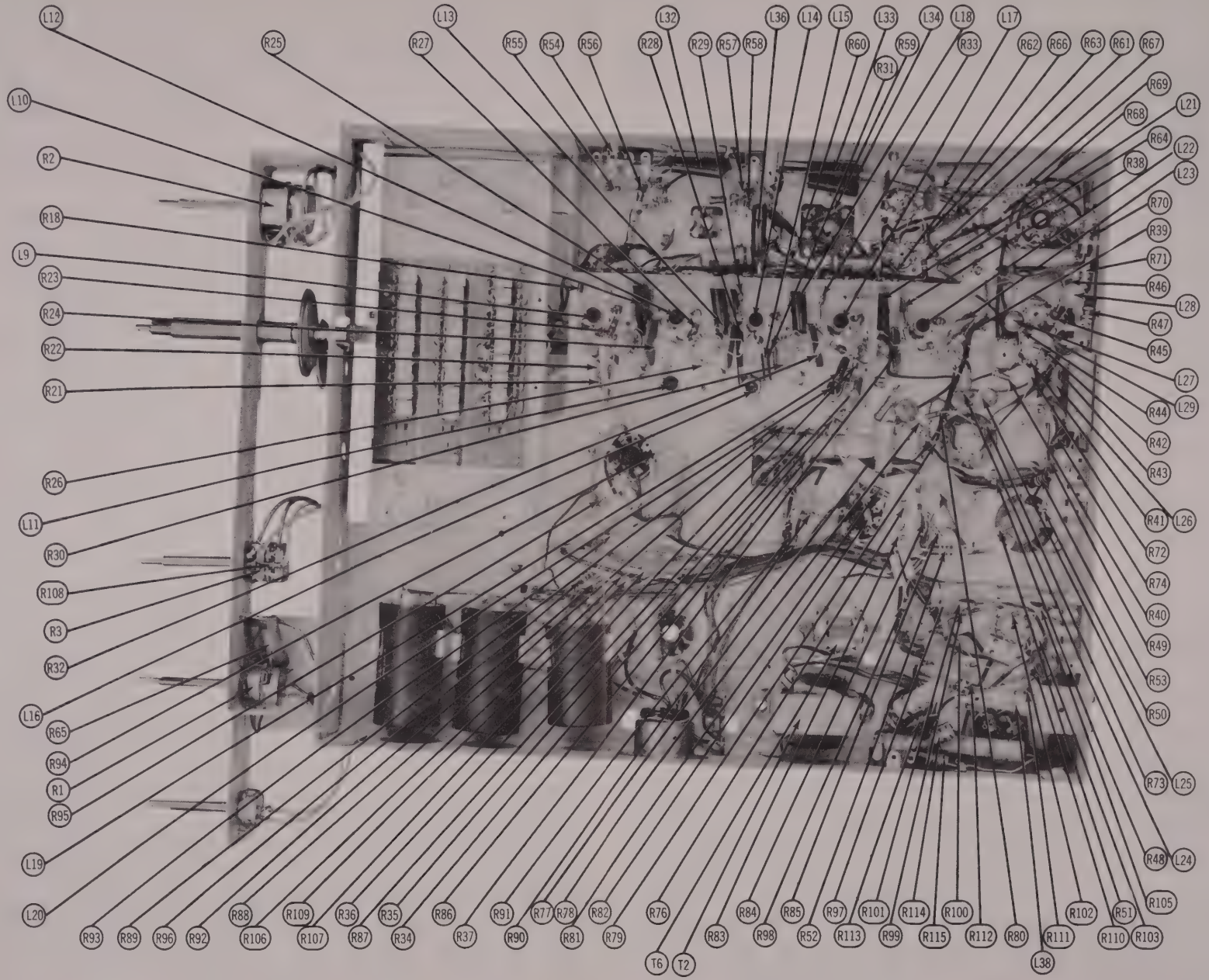
Adjust the high voltage oscillator trimmer, (B2), until the kilovolt meter reads 12KV with the trimmer on the low capacity side of maximum voltage.



RF TUNER-SIDE VIEW



RF TUNER-BOTTOM VIEW



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6BH6	6BH6	7CM	
V2	Mixer	6AG5	6AG5	7BD	
V3	Osc.	6C4	6C4	6BG	
V4	1st Video IF Amp.	6BH6	6BH6	7CM	
V5	2nd Video IF Amp.	6BH6	6BH6	7CM	
V6	3rd Video IF Amp.	6BH6	6BH6	7CM	
V7	4th Video IF Amp.	6BH6	6BH6	7CM	
V8	Video Det.	6AL5	6AL5	6BT	
V9	1st Video Amp.	6AU6	6AU6	7BK	
V10	2nd Video Amp.	6AK6	6AK6	7BK	
V11	DC Rest. -Sync.Sep.	12AU7	12AU7	7A	
V12	Keyed AGC	6AU6	6AU6	7BK	
V13	1st Sound IF Amp.	6AU6	6AU6	7BK	
V14	2nd Sound IF Amp.	6AU6	6AU6	7BK	
V15	Ratio Det.	6AL5	6AL5	6BT	
V16	AF Amp.	6AT6	6AT6	7BT	
V17	Audio Output	6V6GT	6V6GT	7AC	
V18	Sync. Amp. -Vert. Osc.	6SN7GT	6SN7GT	8BD	
V19	Vert. Output	6V6GT	6V6GT	7AC	
V20	Horiz. Phase Det.	6AL5	6AL5	6BT	
V21	Horiz. Mult.	12AU7	12AU7	9A	
V22	Horiz. Output	6BG6	6BG6	5BT	
V23	Damper	5V4G	5V4G	5L	
V24	HV Osc.	6SN7GT	6SN7GT	8BD	
V25	HV Rect.	1B3GT	1B3GT	3C	
V26	LV Rect.	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: SPARTON PART No.	SYLVANIA PART No.	THOMAS PART No.	RTMA BASE TYPE	NOTES
V27	16AP4	16AP4A		12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SPARTON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	475	PA4307-7	AFH2-72		UP4450		TVL-2830	▲ Filter
B	40	475							▲ Filter
C2	80	300	PA4309-1	AFH1-35		UP8035		TVL-1573	▲ Filter
C3	80	300	PA4309-1	AFH1-35		UP8035		TVL-1573	Bias Filter
C4A	15	350	PA4307-6	AFH4-54		UPT15T		TVL-4708	▲ Vert. Output Dec.
B	15	350				35V5		TVA-1308	■ Decoupling
C	15	350							▲ Decoupling
D	50	50							Vert. Output Cathode
C5A	15	450	PA4307-8	AFH4-65		UPT1l145C		TVL-4760	▲ 2nd. Video Amp. Plate
B	10	450							■ 2nd. Video Amp. Screen
C	10	450							▲ 1st. Video Amp. Screen
D	20	25							Not used.
C6A	10	400	PA4307-5	AFH4-59		UPT1l145C		TVL-4723	▲ Picture Tube Cathode
B	10	400							■ Audio Output Dec.
C	10	400							▲ Not used
D	20	25							Audio Output Cathode
C7	4	50	PA4303-12	PRS150/4		BR-550		TVA-1303	Damper Plate
C8	5	50	PA4308-2	PRS150/4		BR-550		TVA-1303	Stabilizing Cap.
C9	15				TCZ-15		NP0K-150	5TCC-Q15	Fixed Padder
C10	15				TCZ-15		NP0K-150	5TCC-Q15	Fixed Padder
C11	15				TCZ-15		NP0K-150	5TCC-Q15	Fixed Padder
C12	15				TCZ-15		NP0K-150	5TCC-Q15	Fixed Padder
C13	47			SI47N750	TCN-47		N750K-470	5TCU-Q47	RF Coupling
C14	470			SI470	D6-471		GP2K-471	5GA-T47	AGC Filter
C15	470			SI470	D6-471		GP2K-471	5GA-T47	RF Amp. Screen
C16	470			SI470	D6-471		GP2K-471	5GA-T47	RF Bypass
C17	47			SI47	D6-470		GP1K-470	5GA-Q47	RF Coupling
C18	470			SI470	D6-471		GP2K-471	5GA-T47	Mixer Screen
C19	470			SI470	D6-471		GP2K-471	5GA-T47	Mixer Filament
C20	1.5			SI1.5NP0	TCZ-1.5		NP0K-1R5		Osc. Coupling
C21	10			SI10N750	TCN-10		N750K-100	5TCU-Q1	Osc. Feedback
C22	10						N330K-100		Osc. Grid Cap.
C23	470			SI470	D6-471		GP2K-471	5GA-T47	Osc. Fil.
C24	100		CC30A-101F	SI100NP0	TCZ-100		NP0-333-101	5TCC-T1	Fixed Trimmer
C25	1000		HK36H-102	SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	Mixer Plate Dec.
C26	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Bypass
C27	270		HK36M-271	SI270	D6-271	5W5T3	GP2K-271	5GA-T27	IF Coupling
C28	1000		HK36H-102	SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	AGC Filter
C29	100		CC30A-101F	SI100NP0	TCZ-100		NP0-333-101	5TCC-T1	Fixed Trimmer
C30A	1000		PA4339-2	BPD-001	DD-102	1W5D1	801-001	5HK-D1	1st. Video IF Plate
B	1000			BPD-001	DD-102	1W5D1	801-001	5HK-D1	1st. Video IF Screen
C	1000			BPD-001	DD-102	1W5D1	801-001	5HK-D1	1st. Fideo IF Fil.
C31	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Fil. Bypass
C32	270		HK36M-271	SI270	D6-271	5W5T3	GP2K-271	5GA-T27	IF Coupling
C33A	1000		PA4339-2	BPD-001	DD-102	1W5D1	801-001	5HK-D1	2nd. Video IF Plate
B	1000			BPD-001	DD-102	1W5D1	801-001	5HK-D1	2nd. Video IF Screen
C	1000			BPD-001	DD-102	1W5D1	801-001	5HK-D1	2nd. Video IF Fil.
C34	270		HK36M-271	SI270	D6-271	5W5T3	GP2K-271	5GA-T27	IF Coupling
C35A	1000		PA4339-2	BPD-001	DD-102	1W5D1	801-001	5HK-D1	3rd. Video IF Plate
B	1000			BPD-001	DD-102	1W5D1	801-001	5HK-D1	3rd. Video IF Screen
C	1000			BPD-001	DD-102	1W5D1	801-001	5HK-D1	3rd. Video IF Fil.
C36	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	5HK-D5	3rd. Video IF Cathode
C37	470	500	MC60E-471	1469-0005		5R5T5		MS-35	Fixed Trimmer
C38	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Fil. Bypass
C39	270		HK36M-271	SI270	D6-271	5W5T3	GP2K-271	5GA-T27	IF Coupling
C40	1000		HK36H-102	SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	AGC Filter
C41	1000		HK36H-102	SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	4th. Video IF Grid

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SPARTON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C42A	1000		PA4339-2	BPD-001	DD-102	1W5D1	801-001	5HK-D1	4th. Video IF Plate
B	1000			BPD-001	DD-102	1W5D1	801-001	5HK-D1	4th. Video IF Screen
C	1000			BPD-001	DD-102	1W5D1	801-001	5HK-D1	4th. Video IF Fil.
C43	470	500	MC60E-471	1469-0005		5R5T5		MS-35	Fixed Trimmer
C44	270		HK36M-271	SI270	D6-271	5W5T3	GP2K-271	5GA-T27	IF Coupling
C45	4.7		PA4328-11	SI4.7NP0	TCZ-4.7		NP0K-4R7		Video Det. Fil.
C46	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Bypass
C47	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Bias Filter
C48	.1	400	PC40GL-154	P488-1		DF-104	PTE4P1	4TM-P1	Video Coupling
C49	.1	400	PC40GL-104	P488-1		DF-104	PTE4P1	4TM-P1	Video Coupling
C50	.1	200	PC40GK-104	P288-1		DF-104	PTE4P1	2TM-P1	AGC Filter
C51	.1	200	PC40GK-104	P288-1		DF-104	PTE4P1	2TM-P1	AGC Filter
C52	100		CC32A-101A	SI100NP0	TCZ-100			5TCC-T1	Sound IF Coupling
C53	1000		HK36H-102	SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	AVC Filter
C54	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Bias Filter
C55	100		HK36G-101	SI100	D6-101	5W5T1	GP1K-101	5GA-T1	Sound IF Coupling
C56	1000		HK36H-102	SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	2nd. Sound IF Cathode
C57	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	5HK-D5	2nd. Sound IF Fil.
C58	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	5HK-D5	2nd. Sound IF Fil.
C59	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Bias Filter
C60	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Ratio Det. Fil.
C61	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Ratio Det. Fil.
C62	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Bypass
C63	47		CC30A-470F	SI47NP0	TCZ-47		NP0K-470	5TCC-Q47	Diode Load Cap.
C64	47		CC30A-470F	SI47NP0	TCZ-47		NP0K-470	5TCC-Q47	Diode Load Cap.
C65	2000		PA4334-3	BPD-002	DD-202	1W5D2	801-002	5HK-D2	DE-emphasis
C66	.02	400	PC40GL-203	P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C67	.02	400	PC40GL-203	P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C68	1000		HK36H-102	SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	AVC Filter
C69	.05	200	PC40GK-503	P288-05	DF-503	PTE4S5		2TM-S5	AVC Filter
C70	.02	400	PC40GL-203	P488-02	DF-203	PTE4S2		2TM-S2	Audio Coupling
C71	.005	200		P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Tone Comp.
C72	.03	200		P488-03		PTE6S3		6TM-S3	Tone Comp.
C73	.006	500	PC40GM-602	P688-006		PTE6D6	GP2-333-602	6TM-D6	Audio Output Plate
C74	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	5HK-D5	DC Rest - Sync. Sep. Fil.
C75	22		CC30A-22K		TCZ-22		NP0K-220	5TCC-Q22	DC Rest - Sync. Sep. Grid
C76	.01	400	PC40GL-103	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Sync. Coupling
C77	.01	400	PC40GL-103	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Vert.Sync. Coupling
C78A	.0033			P688-0033	D6-332	PTE6D3	GP2-333-332	6TM-D33	Vert. Integrator Net.
B	.0047			P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Vert. Integrator Net.
C	.0047			P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Vert. Integrator Net.
C79	4700	500	MC61F-472	1464-005		1DR5D5		MS-25	Vert. Osc. Grid Cap.
C80	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Vert. Osc. Grid Filter
C81	.1	400	PC40GL-104	P488-1		DF-104	PTE4P1	4TM-P1	Vert. Discharge
C82	.25	400	PC40GL-254	P488-25			GT4P25	4TM-P25	Vert. Sweep Coupling
C83	.1	200	PC40GK-104	P288-1		DF-104	PTE4P1	2TM-P1	Fixed Trimmer
C84	470	500	MC60E-471	1468-0005	D6-471	5W5T5	GP2K-471	1FM-35	Horiz. Sync. Coupling
C85	470	500	MC60E-471	1468-0005	D6-471	5W5T5	GP2K-471	1FM-35	Horiz. Sync. Coupling
C86	6800	500	MC61F-682	1467-007	D6-682	1D3D3	GP2-333-682	1FM-27	AFC Coupling
C87	.1	200	PC40GK-104	P288-1		DF-104	PTE4P1	2TM-P1	AFC Filter
C88	220	500	MC60E-221	1469-00025					Horiz. MV Feedback
C89	680	500		1479-0007		2R5T7		MS-37	Horiz. Discharge
C90	5000		PA4334-1	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Horiz. Sweep Coupling
C91	.25	400	PC40GL-254	P488-25		GT2P25		4TM-P25	Horiz. Output Screen
C92	.5	200	PC40GK-504	P288-5		GT2P5		2TM-P5	Horiz. Output Cathode
C93	.05	200	PC40GK-503	P288-05	DF-503	PTE4S5		2TM-S5	Damper Filter
C94	.06	400	PC40GL-603	684-06				6TM-S6	Horiz. Sweep Coupling
C95	470	800	PA4340-3						Fixed Trimmer
C96	.05	400	PC40GL-503	P488-05	DF-503	PTE4S5		4TM-S5	HV Osc. Dec.
C97	.05	400	PC40GL-503	P488-05	DF-503	PTE4S5		4TM-S5	Bias Filter
C98	5600	500	MC61F-562						HV Osc. Grid Cap.
C99	1500	500	MC61E-152	1464-0015		IR5D15			Fixed Trimmer
C100	.05	400	PC40GL-503	P488-05	DF-503	PTE4S5		4TM-S5	RF Bypass
C101	470	20000	PA4338	HV20A	TV1-502		410-501		HV Filter
C102	.05	400	PC45GM-503	P488-05	DF-503	PTE4S5		4TM-S5	Line Filter

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SPARTON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1Meg		PA-4420	Concentrikit			
B	330K			B11-137 *			Tone control-Panel
C	Shaft end			B18-132X *			Volume Control-Rear
				E-187 *			Attach per instructions in Concentrikit
R2A	3000Ω			Concentrikit			
B	25KΩ		PA4435	B11-112 *	RTV-298		Contrast control-Panel
C	Shaft end			B11-120 *			Brightness control- Rear
				E-187 *			Attach per instructions in "Concentrikit"
R3A	300kΩ			Concentrikit			
B	500kΩ		PA-4422-1	B11-133*			Horizontal hold control -Panel
C	Shaft end			B11-133 *			Vertical hold control-Rear
				E-187 *			Attach per instructions in "Concentrikit"
R4	5000Ω	2	PA4411	W-5000	43-5000	V-135	Vertical Linearity Control-Wire Wound
R5A	1000Ω	1	PA4434	Q11-108	AM-8-S	AN-5	AGC Threshold
B	Shaft			Not Req.	FKS-1/4	AK-1	Attach to R5A per instructions.
R6	10KΩ	2	PA4413	W-10000	43-10000	VK-137	Height Control-Wire Wound
R7	7500Ω	4	PA4424			SVP-990	Horizontal Size Control-Wire Wound
R8	2000	4	PA4425		10-2000	SVP-996	Focus Control-Wire Wound

* Additional parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SPARTON PART No.	IRC PART No.	IDENTIFICATION CODES All resistors ± 10% unless otherwise specified
R9	100KΩ 20%				Antenna Loading
R10	100KΩ 20%				Antenna Loading
R11	1000Ω			BTS-1000	AGC Network
R12	47KΩ			BTS-47K	RF Amplifier Grid
R13	100Ω			BTS-100	RF Amplifier Cathode
R14	15KΩ			BTS-15K	RF Amplifier Screen
R15	2200Ω 5%			BTS-2200-5%	RF Amplifier Plate
R16	1Meg				Mixer Grid
R17	56KΩ			BTS-56K	Mixer Screen
R18	1500Ω 20%			BTS-1500	Mixer Plate Decoupling

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SPARTON PART No.	IRC PART No.	IDENTIFICATION CODES
R19	470Ω			BTS-470	Oscillator Plate
R20	18KΩ			BTS-18K	Oscillator Grid
R21	10000Ω 20%			BTS-1000	AGC Network
R22	15KΩ 5%			BTS-15K-5%	1st Video IF Grid
R23	68Ω				1st Video IF Cathode
R24	15KΩ			BTS-15K	1st Video IF Screen
R25	1500Ω 20%			BTS-1500	1st Video IF Decoupling
R26	4700Ω 5%			BTS-4700-5%	2nd Video IF Grid
R27	100Ω			BTS-100	2nd Video IF Cathode
R28	15KΩ			BTS-15K	2nd Video IF Screen
R29	1500Ω 20%			BTS-1500	2nd Video IF Decoupling
R30	15KΩ 5%			BTS-15K-5%	3rd Video IF Grid
R31	100Ω			BTS-100	3rd Video IF Cathode
R32	15KΩ			BTS-15K	3rd Video IF Screen
R33	1500Ω 20%			BTS-1500	3rd Video IF Decoupling
R34	1000Ω 20%			BTS-1000	AGC Network
R35	3300Ω 5%			BTS-3300-5%	4th Video IF Grid
R36	68Ω				4th Video IF Cathode
R37	15KΩ			BTS-15K	4th Video IF Screen
R38	1500Ω 20%			BTS-1500	4th Video IF Decoupling
R39	150Ω 20%			BTS-150	Bias Network
R40	3300Ω 5%			BTS-3300-5%	Video Amplifier Grid
R41	47KΩ			BTS-47K-5%	Video Amplifier Screen
R42	1800Ω 5%			BTS-1800-5%	Video Amplifier Plate
R43	3900Ω			BTS-3900	Peaking Coil Shunt
R44	39KΩ			BTS-39K	Peaking Coil Shunt
R45	100KΩ	1		BTA-100K	Video Output Screen
R46	6800Ω 5%	1		BTA-6800-5%	Video Output Plate
R47	3300Ω	1		BTA-3300	Video Output Plate
R48	47Ω			BTS-47	Bias Network
R49	2200Ω			BTS-2200	Video Peaking
R50	100KΩ			BTS-100K	Picture Tube Grid
R51	470Ω 20%				ACC. Anode Decoupling
R52	47KΩ			BTA-47K	Voltage Divider
R53	6800Ω	1		BTA-6800	Voltage Divider
R54	100KΩ			BTS-100K	AVC Network
R55	100KΩ			BTS-100K	1st Sound IF Grid
R56	82Ω 5%			BTS-82-5%	1st Sound IF Cathode
R57	100KΩ			BTS-100K	2nd Sound IF Grid
R58	68Ω				2nd Sound IF Cathode
R59	220Ω			BTS-220	Balancing
R60	27KΩ			BTS-27K	De-Emphasis
R61	10KΩ			BTS-10K	Ratio Detector Diode Load
R62	10KΩ			BTS-10K	Ratio Detector Diode Load
R63	220KΩ 20%			BTS-220K	AVC Network
R64	2.2Meg20%			BTS-2.2Meg	AVC Network
R65	10KΩ			BTS-10K	Tone Compensation
R66	10Meg 20%			BTS-10Meg	Audio Amplifier Grid
R67	270KΩ 5%			BTS-270K-5%	Audio Amplifier Plate
R68	470KΩ 20%			BTS-470K	Audio Output Grid
R69	330Ω	1		BTA-330	Audio Output Cathode
R70	1200Ω	2		BTB-1200	Audio Output Decoupling
R71	1200Ω	2		BTB-1200	Audio Output Decoupling
R72	22KΩ			BTS-22K	Isolation
R73	15KΩ 20%			BTS-15K	AGC Amplifier Screen
R74	27KΩ			BTS-27K	Bleeder
R75	100KΩ	1		BTA-100K	Voltage Divider
R76	100KΩ			BTS-100K	AGC Network
R77	330KΩ 20%			BTS-330K	AGC Network
R78	22KΩ 20%			BTS-22K	Voltage Divider
R79	270KΩ			BTS-270K	Sync. Seperator Grid
R80	1Meg 20%			BTS-1Meg	Sync. Seperator Plate
R81	1Meg 20%			BTS-1Meg	Sync. Amplifier Grid
R82	2200Ω 5%			BTS-2200-5%	Sync. Smplifier Cathode
R83	6800Ω			BTS-6800	Sync. Amplifier Plate
R84	3300Ω 5%			BTS-3300-5%	Sync. Amplifier Plate
R85	2200Ω 20%			BTS-2200	Sync. Amplifier Plate Decoupling
R86	47KΩ			BTS-47K	Integrator Network
R87	22KΩ			BTS-22K	Integrator Network
R88	8200Ω			BTS-8200	Integrator Network
R89	470KΩ			BTS-470K	Integrator Network
R90	3300Ω			BTS-3300	Vertical Oscillator Grid
R91	220KΩ 20%			BTS-220K	Vertical Oscillator Grid
R92	330KΩ 5%			BTS-330K -5%	Vertical Oscillator Plate
R93	3900Ω			BTS-3900	Vertical Peaking
R94	3.3Meg 20%			BTS-3.3Meg	Vertical Output Grid
R95	470Ω 20%			BTS-470	Vertical Output Cathode
R96	2700Ω	1		BTA-2700	Decoupling
R97	100KΩ 5%			BTS-100K-5%	Horizontal AFC Diode Load
R98	100KΩ 5%			BTS-100K-5%	Horizontal AFC Diode Load
R99	470KΩ			BTS-470K	Horizontal AFC Filter
R100	3300Ω			BTS-3300	Horizontal MV Feedback
R101	1000Ω			BTS-1000	Horizontal MV Cathode
R102	47KΩ			BTS-47K	Horizontal MV Plate
R103	470KΩ			BTS-470K	Horizontal MV Grid
R104	330KΩ			BTS-330K	Horizontal MV Grid See Note 1.
R105	180KΩ			BTS-180K	Horizontal MV Plate
R106	330KΩ 5%			BTS-330K-5%	Voltage Dropping
R107	390KΩ 5%			BTS-390K-5%	Voltage Divider
R108	82KΩ 5%			BTS-82K-5%	Voltage Divider
R109	12KΩ	1		BTA-12K	Horizontal MV Decoupling
R110	470KΩ 5%	½		BTS-470K-5%	Horizontal Output Grid
R111	180Ω	2			Horizontal Output Cathode
R112	10KΩ	2		BTB-10K	Horizontal Output Screen
R113	68Ω	2			Horizontal Linearity Network
R114	270Ω	2			Horizontal Linearity Network
R115	270Ω	2			Horizontal Linearity Network
R116	180Ω	2		BW-2-180	Focus Coil Shunt
R117	180Ω	2		BW-2-180	Focus Coil Shunt
R118	100Ω 20%	½		BTS-100	HV Oscillator Decoupling
R119	3900Ω 20%	1		BTA-3900	HV Oscillator Grid
R120	220Ω 20%	1		BTA-220	HV Oscillator Cathode
R121	100Ω 20%	½		BTS-100	HV Oscillator Decoupling
R122A	5KΩ	8		1 3/4A-5K	Bleeder- Wire Wound
B	10KΩ	2		1 3/4A-10K	Bias Network
R123	470KΩ	1			H.V. Filter

Note 1. Not used in all Models.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ 2A	750VCT .240ADC	5VAC @ 3A	6.3VAC @ 5.6A Sec. 4 6.3VAC @ 5.4A	AB44014-1			
T2	6.3VAC @ 2.2A	5.0VAC @ 2.0A			AB47002-1			

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T3	1.7Ω Sec.2 18Ω	680Ω Sec.3 0Ω	AB43547-1				HV Oscillator Trans.
T4	150Ω	780Ω	AB47068-1	A-8111	A-3000	TB0-1	Vert. Oscillator Trans.
T5	640Ω	6.5Ω	AB44062-2	A-8115	A-3035	TS0-1	Vert. Output Trans.
T6	435Ω	1.3Ω	AB47068-1				AGC Pulse Trans.
T7A	32Ω		PC-70002		MD-13		Horiz. Deflection Coils
B	64Ω						Vert. Deflection Coils
T8	400Ω		PB40212		MF-2 ①		Focus Coil

① Fabricate new mounting brackets.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T9	7KΩ	3.4Ω	365Ω	.4Ω	AB44063-1	A-3823	A-3020	R0-201	

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA SPARTON PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	P.M.	3.4Ω	PC63000-1	10J12	10A31	
	CONE DIA.	V. C. DIA.				
SP2	9 3/8 in.	3/4 in.				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.240A	68Ω	4.5H	AB47001-1	C-1412①	C-3189①	TR-3300 ①	① Drill New Mounting Holes

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SPARTON PART No.	MERIT PART No.	IRC PART No.	NOTES
L2	IF Wave Trap coil.	1.2Ω				CLA	1.5 Microhenries
L3	IF Wave Trap coil	1.2Ω				CLA	1.5 Microhenries
L4	Fil. Choke	.1Ω					
L5	Adj. Channel Sound Trap	0Ω					1.6 Microhenries
L6	RF Choke	.1Ω					
L7	Fil. Choke	.1Ω					
L8	RF Osc. Trap	.1Ω		AA6654-1			Wound on 1.5MMF Cap.
L9	1st. Video IF	0Ω		AB43523-1			
L10	Fil. Choke	.1Ω					
L11	Adj. Channel Sound Trap	0Ω		AB43524-1			
L12	2nd. Video IF	0Ω		AB43523-1			
L13	Fil. Choke	0Ω					
L14	3rd. Video IF	.1Ω		AB43523-2			
L15	Grid Choke	1.7Ω		AA6644-1			11 Microhenries
L16	Sound Take off Coil	0Ω	0Ω	AB43524-7			
L17	4th. Video IF	.1Ω		AB43523-2			
L18	Fil. Choke	.1Ω		AA6651-1			
L19	Grid Choke	1.7Ω		AA6644-1			11 Microhenries
L20	Sound Trap	0Ω		AB43524-2			
L21	Fil. Choke	.1Ω		AA6651-1			
L22	5th. Video IF	.1Ω		AB43523-3			

SPARTON MODELS 4964, 4965, 5064, 5065 (Ch. 23TB10)

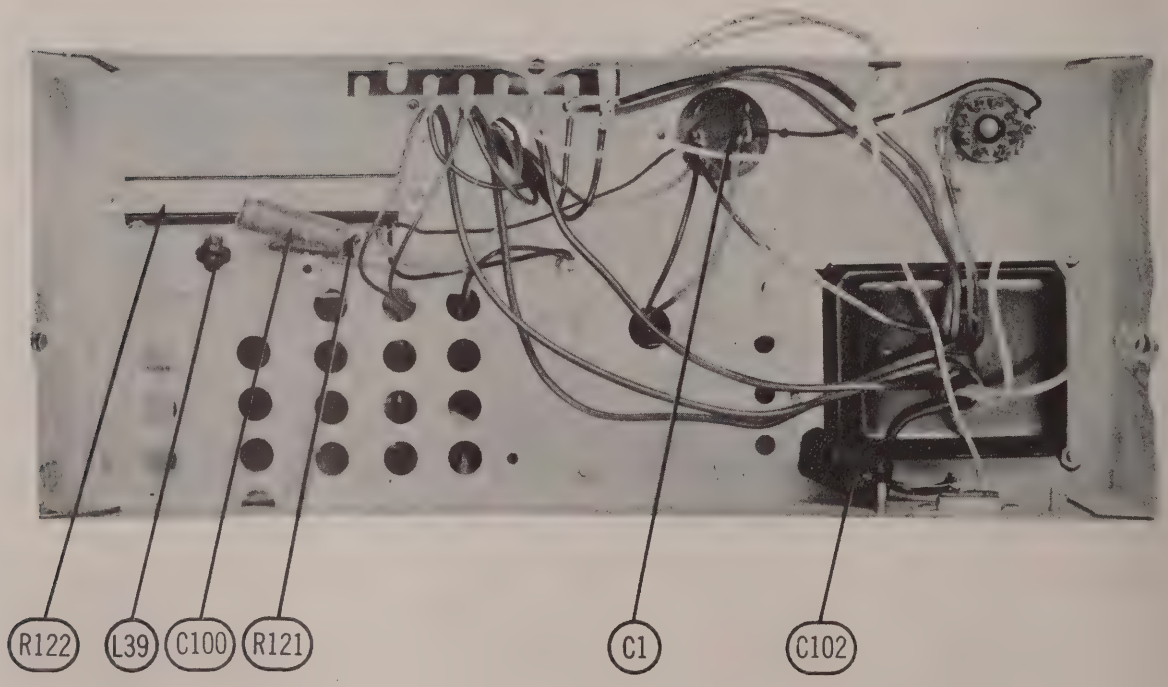
PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF) (CONT.)

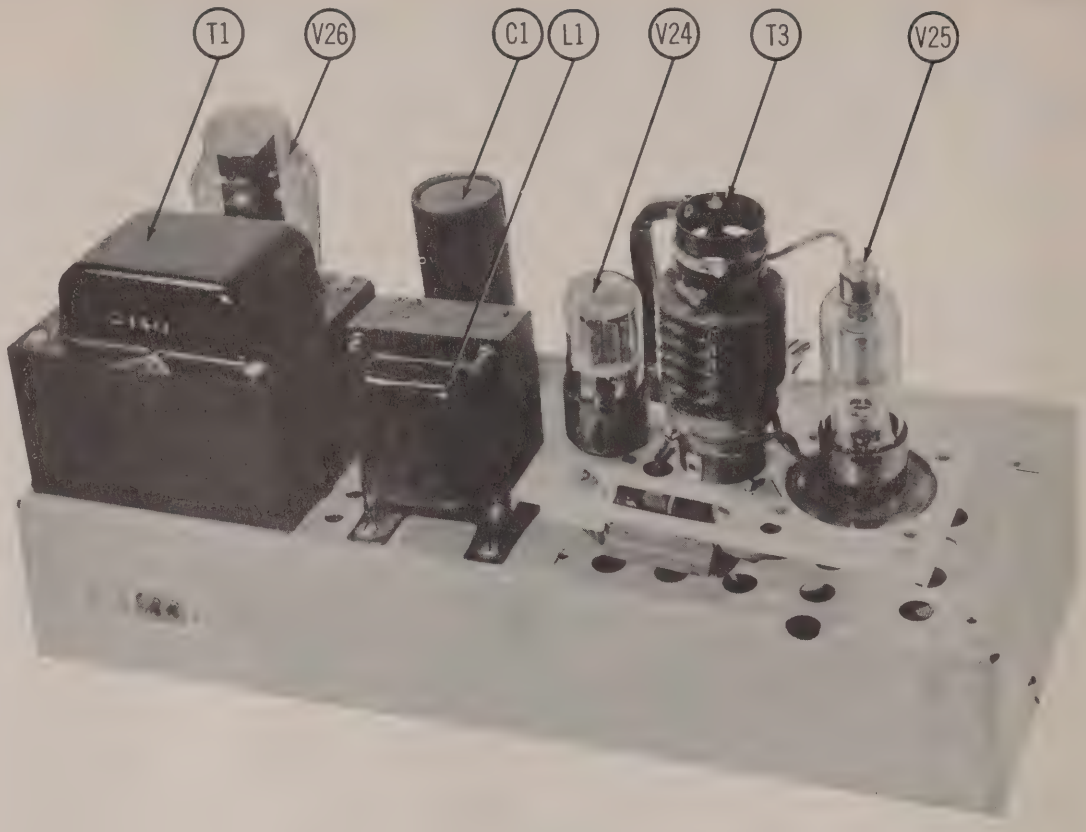
ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	SPARTON PART No.	MERIT PART No.	IRC PART No.	
L23	Cath. Choke	2.7Ω		AA6650-1			25 Microhenries
L24	Peaking Coil	6.3Ω		AA6613-3			95 Microhenries
L25	Peaking Coil	10Ω		AA6613-6			243 Microhenries
L26	Peaking Coil	9.8Ω		AA6613-7			243 Microhenries
L27	Peaking Coil	10.2Ω		AA6613-2			200 Microhenries
L28	Peaking Coil	7.6Ω		AA6613-5			135 Microhenries
L29	Peaking Coil	9.5Ω		AA6613-4			200 Microhenries
L30	Sound IF	.2Ω		AA6663-2			
L31	Cath. Choke						Not used in all Models
L32	RF Choke	.1Ω		AA6651-1			
L33	Fil. Choke	0Ω		AA6651-1			
L34	Fil. Choke	0Ω		AA6651-1			
L35	Cath. Choke						Not used in all Models
L36	RF Choke	.1Ω		AA6651-1			
L37	Ratio Det. Trans.	.4Ω	.1Ω	A6684-2			Tap at .2Ω
L38	Horiz. Lin.	17Ω		AA6659-1			Tap at 8.5Ω
L39	RF Choke	15.8Ω		AA6613-8			600 Microhenries

MISCELLANEOUS

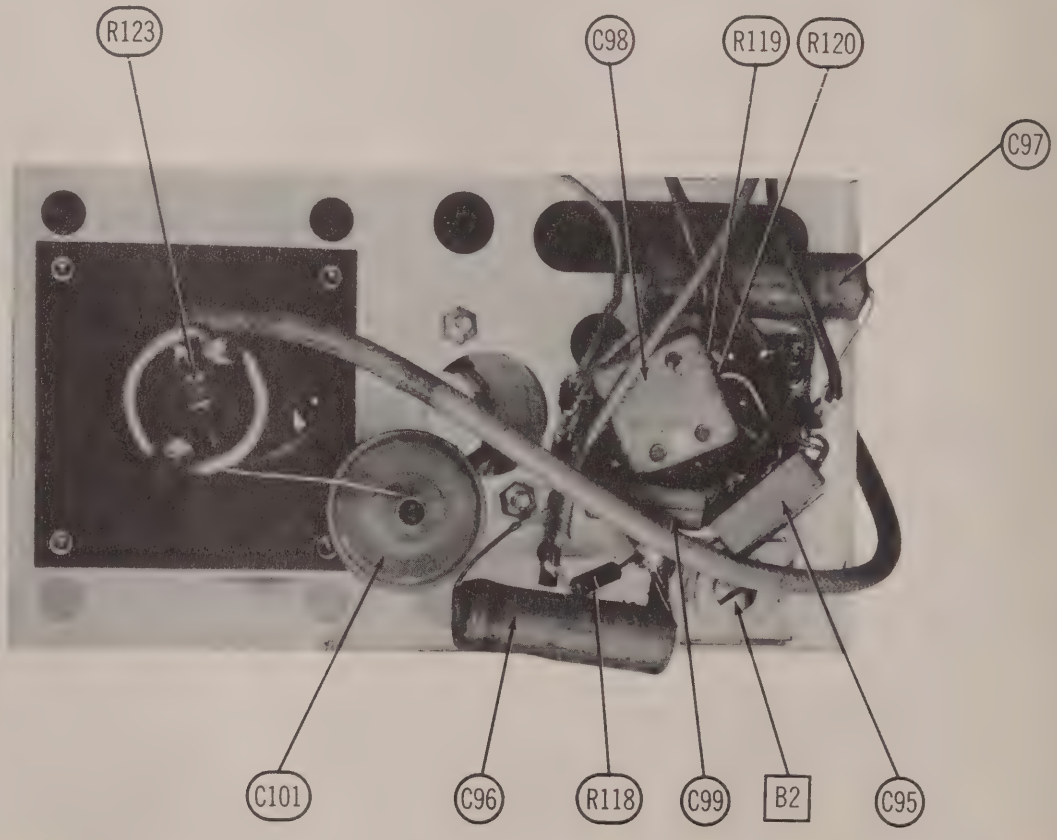
ITEM No.	PART NAME	SPARTON PART No.	NOTES
M1	RF Tuner	AD93151-2	Complete with tubes.
M2	Switch		
M3	Neon Bulb		Voltage Limiter
M4	Ion Trap	PA1227	
B2	Trimmer	PA4380	HV Osc. (280-1050 MMF)
	Glass	PC63073	Safety
	Dial	PA6572-1	Channel Indicator
	Knob	PA5638	Off/On
	Knob	PA5639	Volume, Brightness and Vert. Hold
	Knob	PA5640	Tone, Contrast and Horiz. Hold
	Knob	PA5642	Fine Tuning
	Knbb	AA6334-3	Channel Selector



HIGH VOLTAGE SUPPLY-BOTTOM VIEW



HIGH VOLTAGE SUPPLY-TOP VIEW



H.V. SUPPLY SUB CHASSIS-BOTTOM VIEW

PHOTOFACT* Folder

WESTINGHOUSE MODELS H-660C17, H-661C17 (Ch. V-2203-1 and Radio Ch. V-2180-3)

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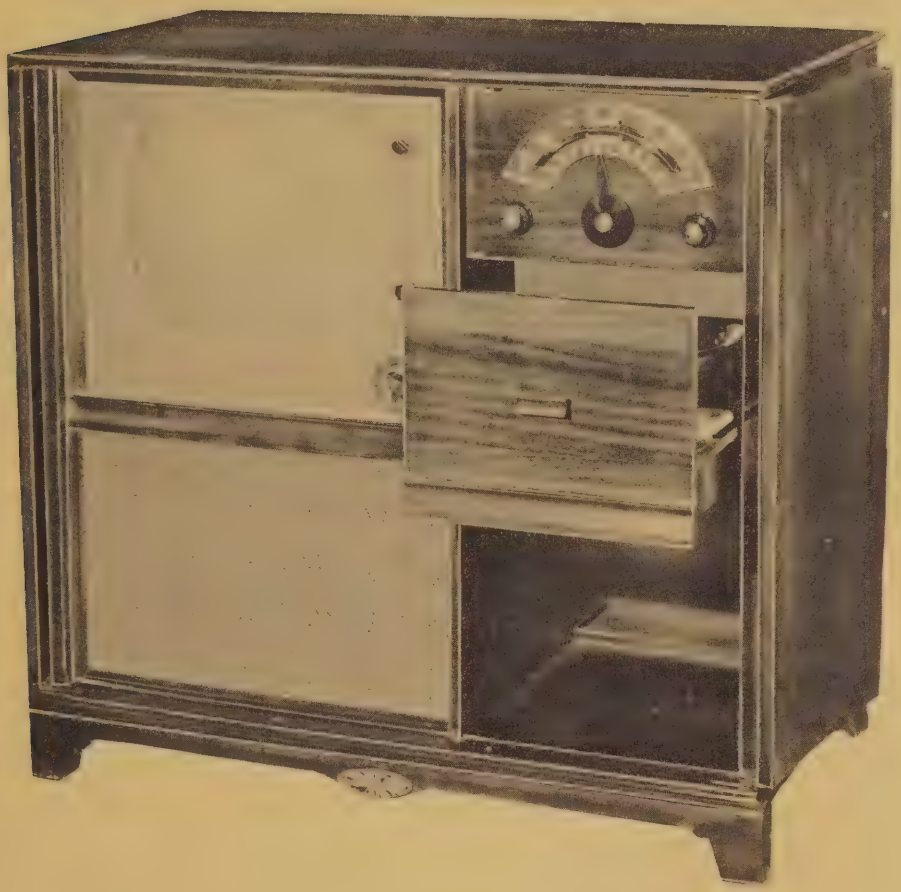
Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MODEL H-660C17

WESTINGHOUSE MODELS H-660C17, H-661C17
(Ch. V-2203-1 and Radio Ch. V-2180-3)

HOWARD W. SAMS & CO., INC. • Indianapolis, Indiana

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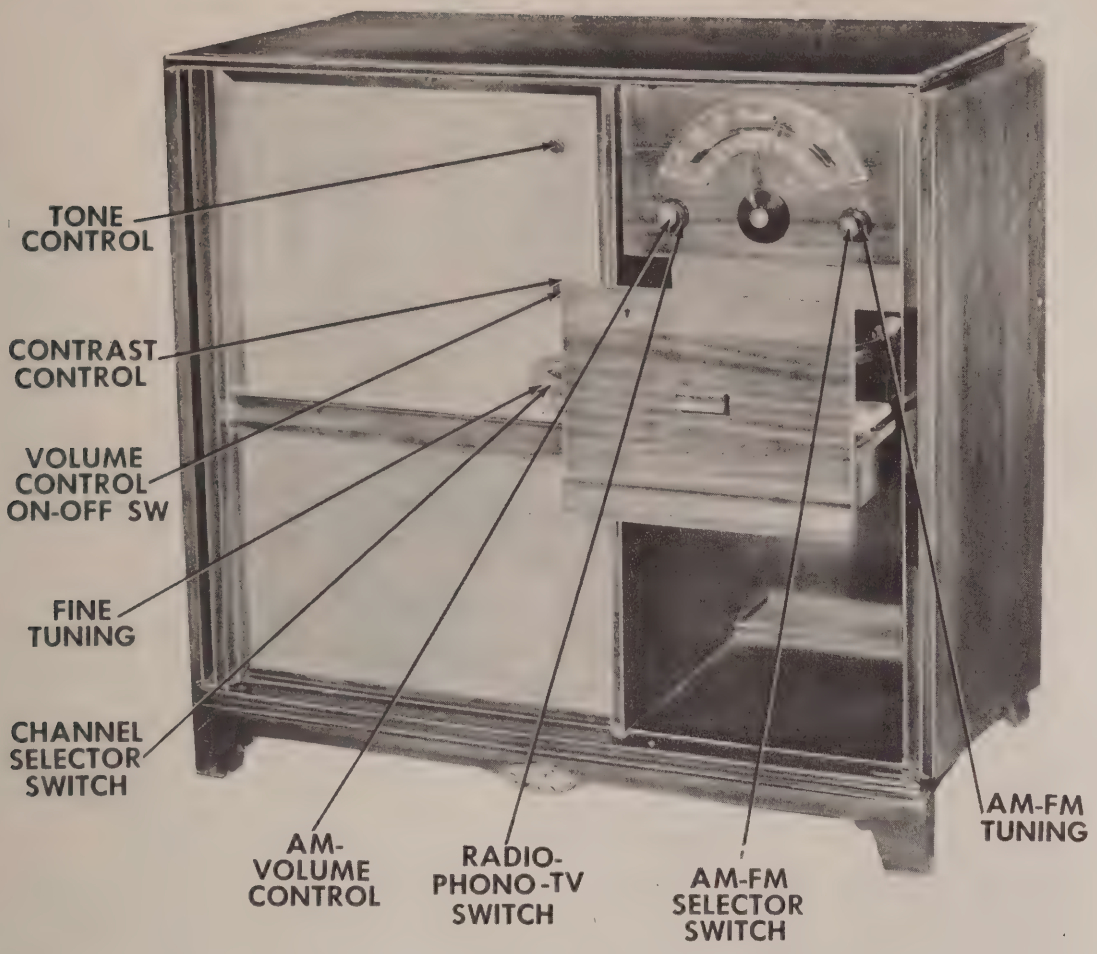
WESTINGHOUSE MODELS H-660C17, H-661C17 (Ch. V-2203-1 and Radio Ch. V-2180-3)



WESTINGHOUSE H-660C17

TRADE NAME	Westinghouse Models, H-660C17, H-661C17,(Ch. V-2203-1 and Radio Ch. V-2180-3)
MANUFACTURER	Westinghouse Electric Corp., Television-Radio Div., Sunbury, Pa.
TYPE SET	TV-FM-AM-Phono Combination Receiver
TUBES	(Thirty)
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	1.8 Amp. @ 117 Volts AC
TUNING RANGE—	TV Channels 2 thru 13, FM 88-108MC, AM 540-1600KC

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FOR SERVICE INFORMATION ON RECORD CHANGER, SEE V-M MODEL 950 PHOTOFACT SET 107, FOLDER 13 OR RECORD CHANGER MANUAL CM-3. ALSO, SEE SUPPLEMENT PHOTOFACT SET 131, FOLDER 17.

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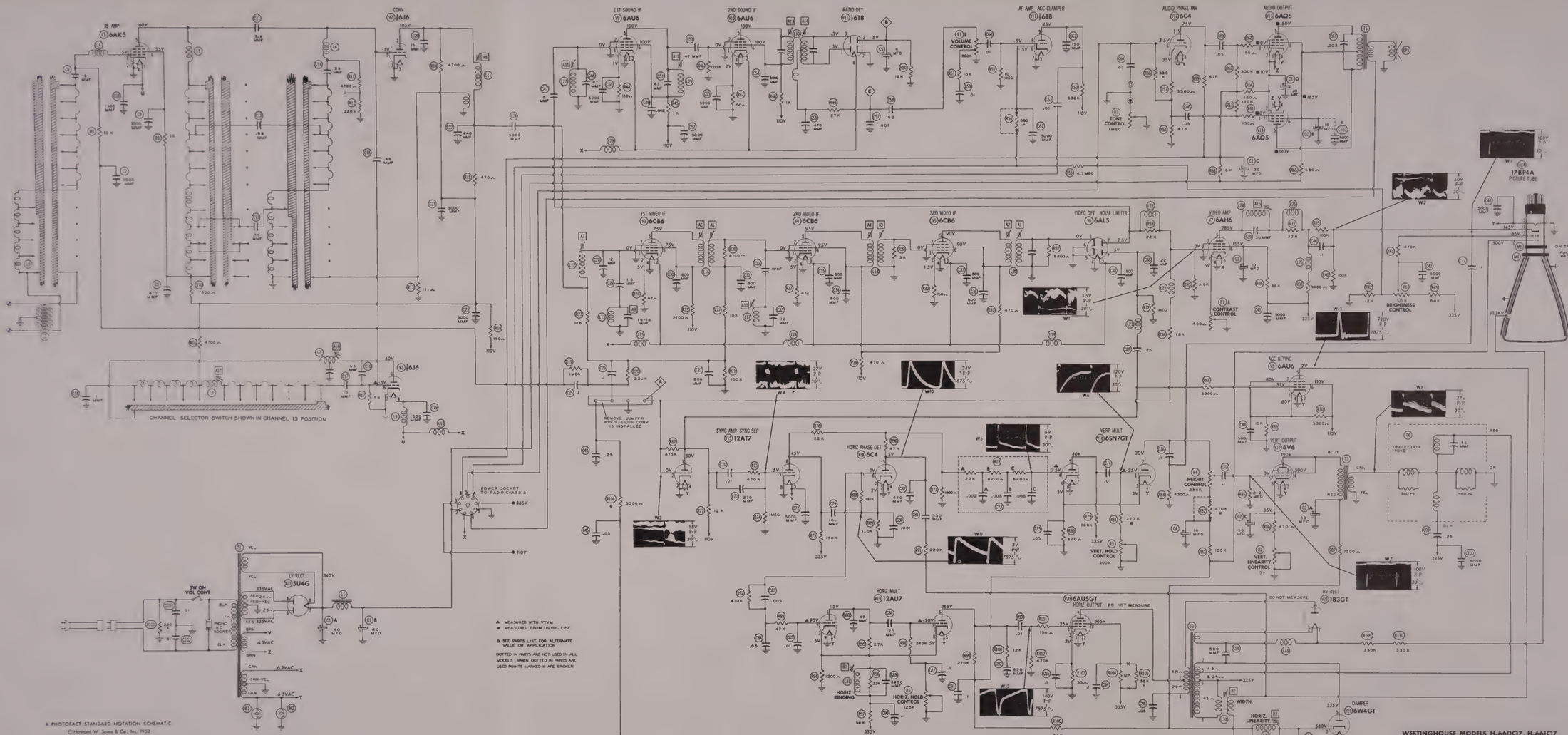
DATE 1-52 SET 157 FOLDER 12

WESTINGHOUSE MODELS H-660C17, H-661C17 (Ch. V-2203-1 and Radio Ch. V-2180-3)


RF AMP Y1 6AK5
CONV Y2 6J6
1ST SOUND IF Y9 6AU6
2ND SOUND IF Y10 6AU6
RATIO DET Y11 6T8
AF AMP AGC CLAMPER Y12 6T8
AUDIO PHASE INV Y13 6C4
AUDIO OUTPUT Y14 6AQ5
1ST VIDEO IF Y3 6CB6
2ND VIDEO IF Y4 6CB6
3RD VIDEO IF Y5 6CB6
VIDEO DET NOISE LIMITER Y6 6AL5
VIDEO AMP Y7 6AH6
17BP4A PICTURE TUBE
AGC KEYING Y8 6AU6
SYNC AMP SYNC SEP Y15 12AT7
HORIZ PHASE DET Y16 6C4
VERT MULT Y17 6SN7GT
VERT OUTPUT Y11 6V6
HORIZ MULT Y19 12AU7
HORIZ OUTPUT Y20 6AU5GT
HV RECT Y21 1B3GT
DAMPER Y21 6W4GT
LV RECT Y21 5U4G
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
REMOVE JUMPER WHEN COLOR CONV IS INSTALLED
POWER SOCKET TO RADIO CHASSIS
SW ON VOL CONT
VOLUME CONTROL
TONE CONTROL
CONTRAST CONTROL
BRIGHTNESS CONTROL
HEIGHT CONTROL
VERT. HOLD CONTROL
VERT LINEARITY CONTROL
HORIZ. RINGING
HORIZ. HOLD CONTROL
WIDTH
HORIZ LINEARITY
ION TRAP
DEFLECTION YOKE
DO NOT MEASURE
▲ MEASURED WITH VTVM
■ MEASURED FROM 110VDC LINE
⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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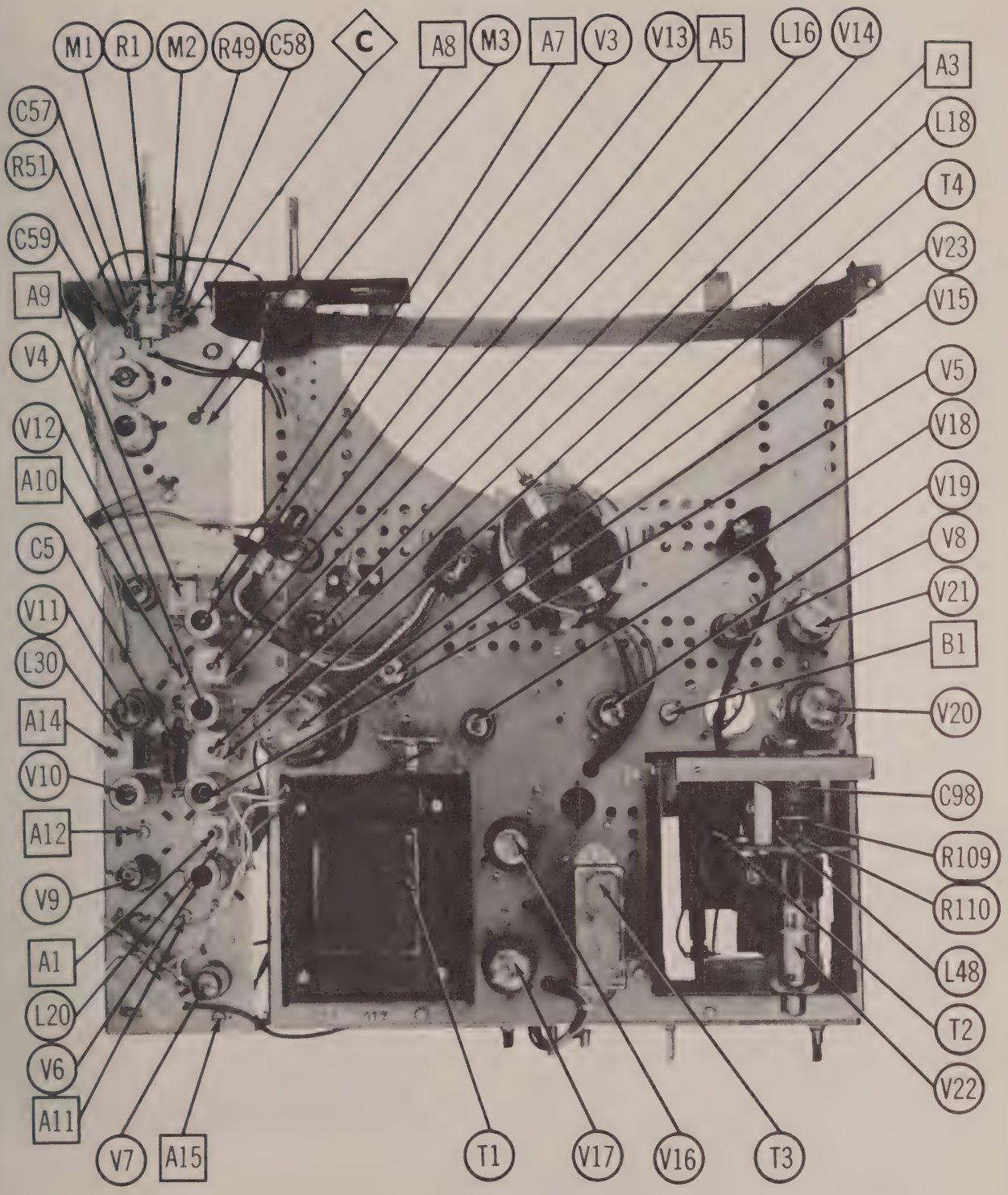
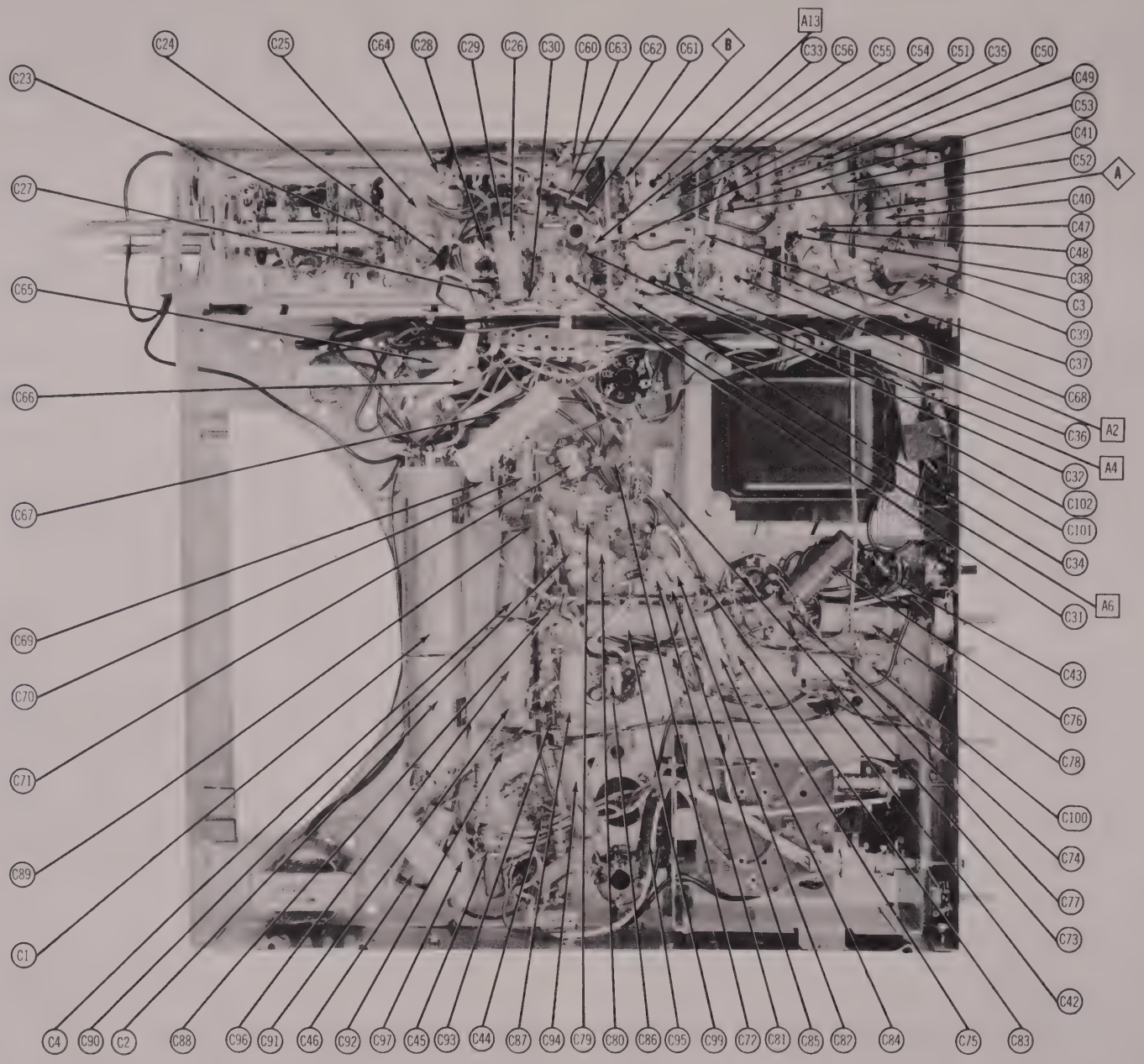
WESTINGHOUSE MODELS H-660C17, H-661C17
(Ch. V-2203-1 and Radio Ch. V-2180-3)

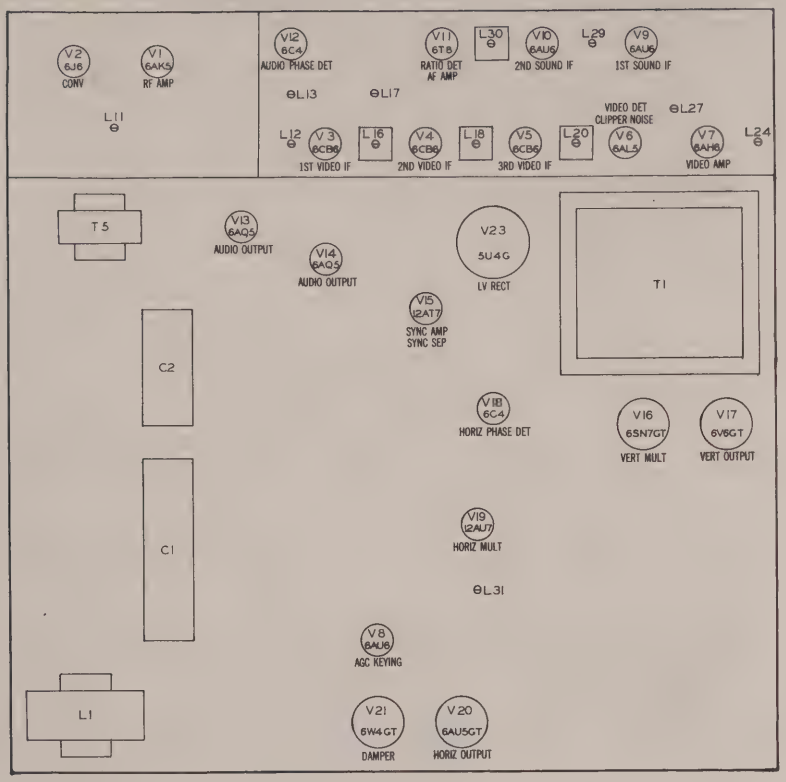
WESTINGHOUSE MODELS H-660C17, H-661C17
(Ch. V-2203-1 and Radio Ch. V-2180-3)



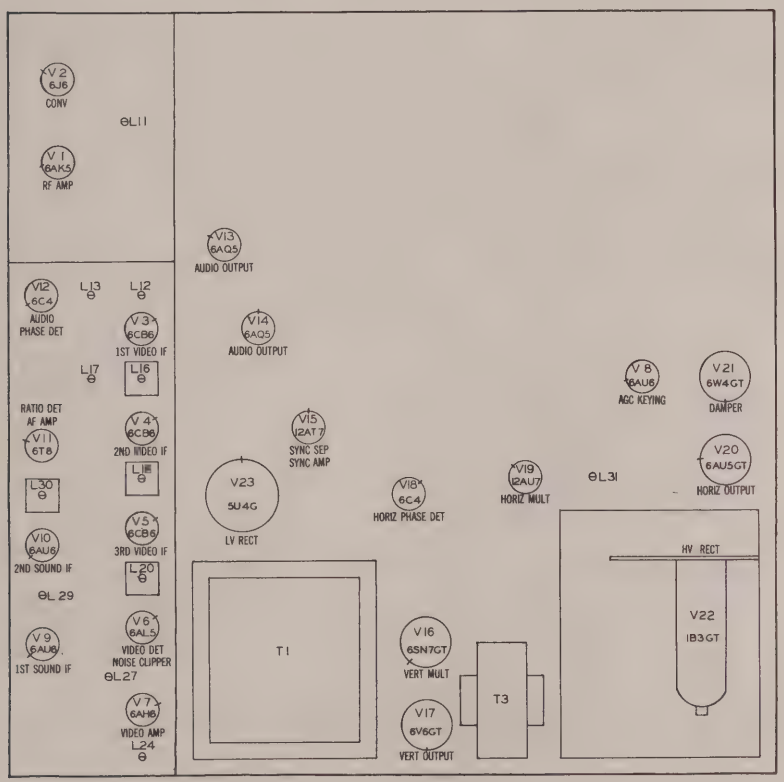
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



BOTTOM VIEW



TOP VIEW

TUBE PLACEMENT CHART

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The end of the high voltage lead should be securely taped and kept away from the chasis. Do not remove the horizontal oscillator tube to disable the high voltage. Turn the function selection switch to TV, (maximum counter-clockwise.)

VIDEO IF ALIGNMENT

Remove the converter tube, (V2), from its socket and replace it with a 6J6 which has Pin 1 removed. This will disable the local oscillator and eliminate the possibility of erroneous indications.
During Video IF alignment it is necessary to detune the primary of the transformer feeding the grid to which the signal generator is connected. This may be conveniently done by clipping an alligator clip to Pin 5 of the preceeding IF tube. The stray capacity this added will sufficiently detune the primary winding. CAUTION B+.
Connect the negative lead of a 3 volt battery to the ungrounded lead of C27, connect the positive lead to chassis.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.005MFD	High side to pin 1, (grid) of 6CB6, (V5). Low side to chassis.	44MC (10MC Swp)	42.25MC 44MC 45.75MC	Any	Vert. Amp. thru 47KΩ to point A. Low side to chassis.	A1, A2	Adjust for response curve similar to fig. 1.
2.	"	High side to pin 1, (grid) of 6CB6, (V4). Low side to chassis.	"	"	"	"	A3, A4	Adjust for response curve similar to fig. 2.
3.	"	High side to pin 1, (grid) of 6CB6, (V3). Low side to chassis.	"	"	"	"	A5, A6	Adjust for response curve similar to fig. 3.
4.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	"	"	"	"	A7, A8,	Turn A9 fully clockwise. Adjust A7 and A8 for response curve similar to fig. 4.
5.	"	"	"	41.25MC	"	"	A9	Adjust for MINIMUM marker indication at the 41.25MC point on response curve.
6.	"	"	"	47.25MC	"	"	A10	Adjust for MINIMUM marker indication of the 47.25MC point on response curve.

SOUND IF ALIGNMENT

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.001MFD	High side to point A. Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point B. Low side to chassis.	A11, A12 A13	Disconnect stabilizor capacitor C5. Adjust for maximum amplitude and symmetry as per fig. 5.
8.	"	"	"	"	"	Vert. Amp. to point C. Low side to chassis.	A14	Reconnect capacitor C5. Adjust A14 so 4.5 MC occurs at center of crossover lines as per fig. 6. SLIGHTLY retouch A13 for Maximum amplitude and straightness of crossover lines.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.001MFD	High side to pin 1, (grid), of 6AH6, (V7). Low side to chassis.	Not used	4.5MC (400% mod.)	Any channel not used locally.	Vert. Amp. to pin 11 of picture tube. Low side to chassis.	A15	Adjust for MINIMUM 400% indication on scope.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47KΩ to point A. Low side to chassis.	A16	Adjust to place marker as shown in fig. 7.
11.	"	"	207MC (10MCSwp)	205.25MC 209.75MC	12	"		Check all high band channels to see if the markers can be properly placed well within the range of the fine tuning control. If not make compromise adjustment of A16.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
12.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A17	Adjust to place markers as shown in fig. 7.
13.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"		Check all low band channels to see if markers can be properly placed well within the range of the fine tuning control. IF not make compromise adjustment of A17.
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

THE RF AND MIXER PORTION OF THIS TUNER HAS BEEN PROPERLY ALIGNED AT THE FACTORY AND IS VERY STABLE. ALIGNMENT OF THIS PORTION SHOULD NOT BE REQUIRED IN THE FIELD.

FIG. 1

FIG. 2

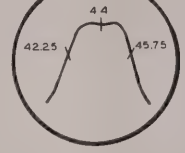


FIG. 3

FIG. 4

FIG. 5

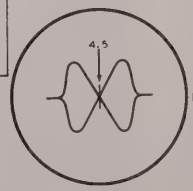


FIG.6

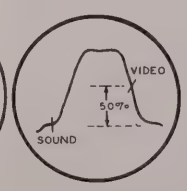


FIG. 7

RADIO ALIGNMENT INSTRUCTIONS (CONT.)

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
13.	.1MFD	High side to stator on rear section of tuning gang. Low side to chassis.	455KC (400% Mod.)	AM (CW)	Tuning gang fully open.	Across voice coil.	A18, A19 A20, A21	Adjust for maximum output.
14.		Loop	1615KC	"	"	"	A22	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
15.		"	1400KC	"	Tune for max. output.	"	A23	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (± 1%) resistors in series from Point F to chassis. The junction of these two resistors is alignment Point F as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
16.	.005MFD	High side to Pin 1, (Grid) of 6BA6, (V27). Low side to chassis.	10.7MC (unmod.)	FM (CCW)	Tuning gang fully open	DC probe to Point F. Common to chassis.	A24, A25, A26	Adjust for maximum deflection
17.	"	High side to Pin 2 (grid) of 12AT7, (V26). Low side to chassis.	"	"	"	"	A27, A28	Adjust for maximum deflection.
18.	"	"	"	"	"	DC probe to Point E. Common to Point F.	A29	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
16.	.005MFD	High side to pin 1, (grid), of 6BA6 (V27). Low side to chassis.	10.7MC (450KC Swp)	FM (CCW)	Point of non-interference.	Vert. Amp. to point D. Low side to chassis.	A24, A25 A26	Disconnect stabilizor capacitor C104. Adjust for maximum amplitude and symmetry as per fig. 8.
17.	"	High side to pin 2, (grid), of 12AT7, (V26). Low side to chassis.	"	"	"	"	A27, A28	"
18.	"	"	"	"	"	"	A29	Reconnect capacitor C104. Adjust A29 so 10.7MC occurs at center of crossover lines as per fig. 9. SLIGHTLY retouch A24 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
19.	300Ω carbon resistor	High side thru 300Ω to FM ant. terminal. Low side to chassis.	98MC (unmod.)	FM	98MC	DC probe to Point D. Common to chassis	A30, A31	Adjust for maximum deflection
20.	"	"	105MC	"	Tune for max. deflection.	"	A32	Adjust for maximum deflection.
21.	"	"	90MC	"	"	"	A31	Rock tuning gang while adjusting A31 for maximum deflection. Repeat steps 19, 20 and 21 until no further improvement can be made.

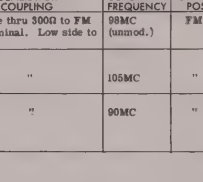


FIG. 8

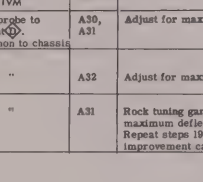


FIG. 9

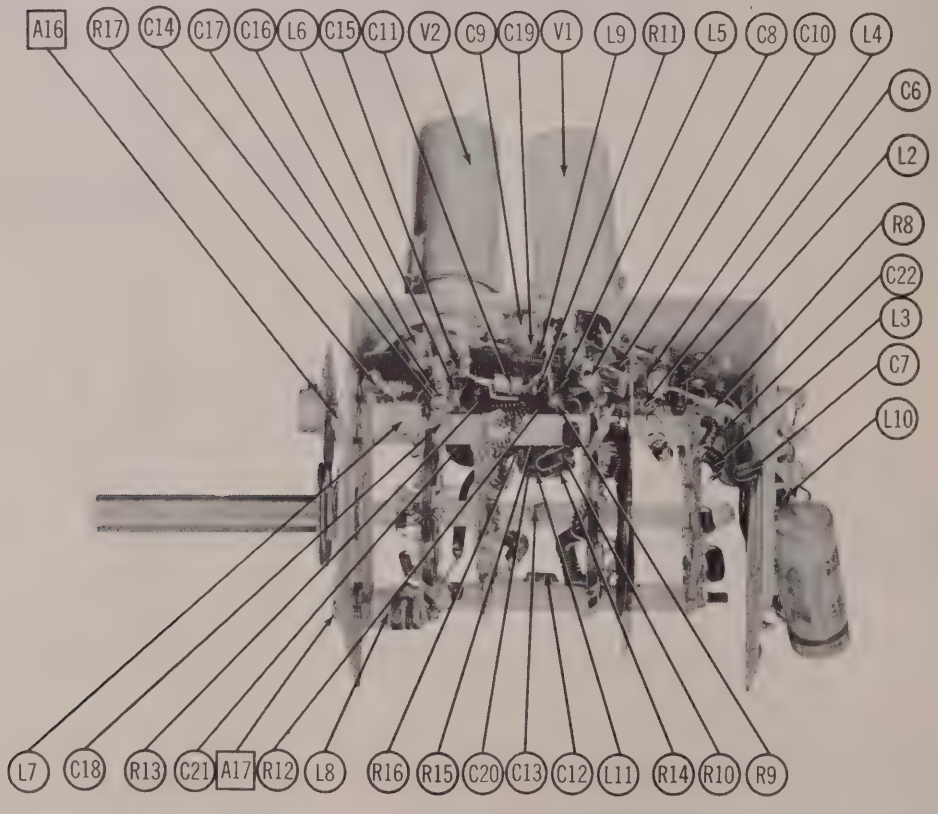
WESTINGHOUSE MODELS H-660C17, H-661C17
(Ch. V-2203-1 and Radio Ch. V-2180-3)

RESISTANCE MEASUREMENTS

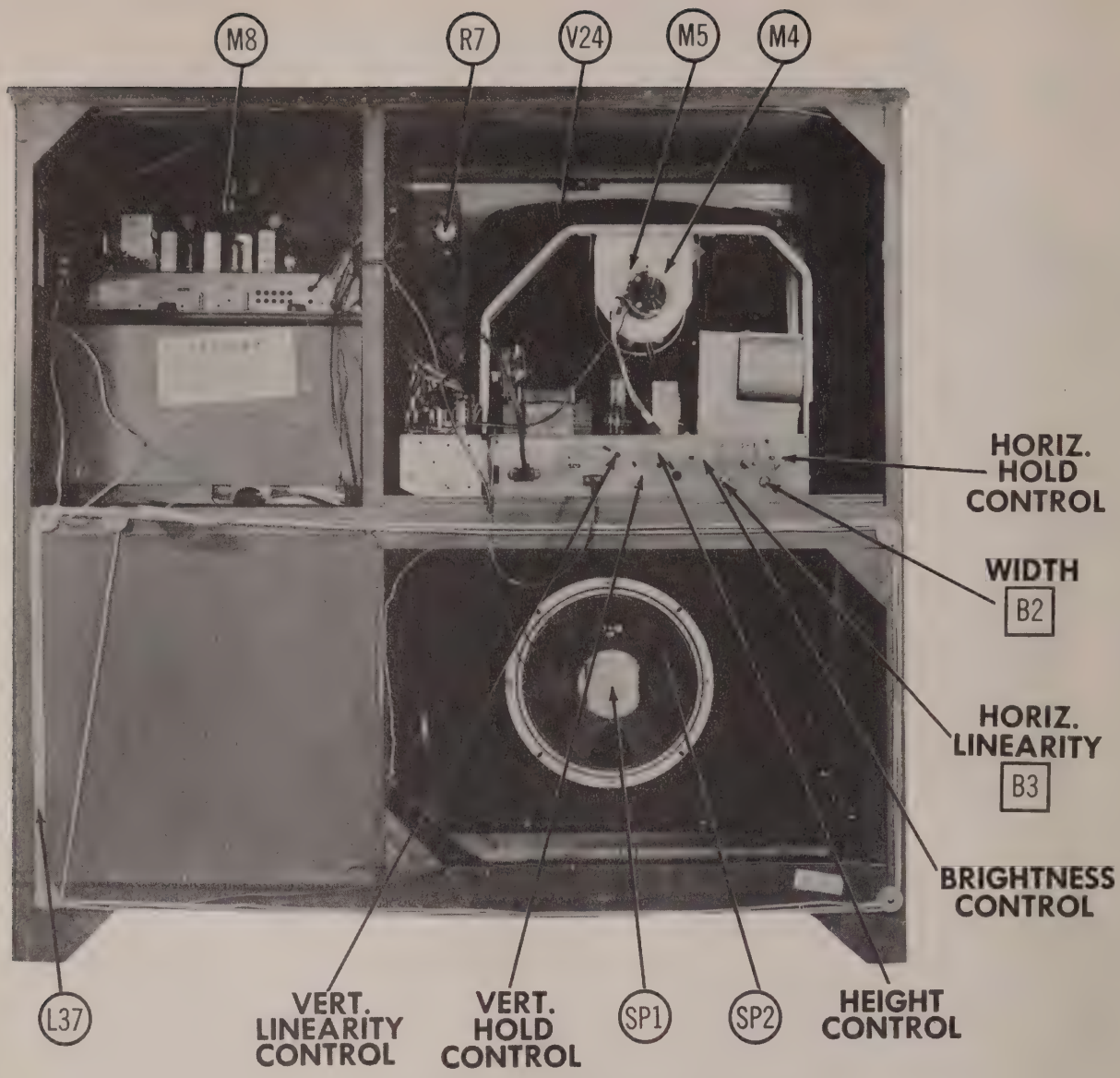
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AK5	1.3Meg	0Ω	.1Ω	0Ω	■7.6KΩ	■8.6KΩ	0Ω		
V 2	6J6	■4.8KΩ	■620Ω	0Ω	.1Ω	220KΩ	15KΩ	0Ω		
V 3	6CB6	110KΩ	47Ω	.1Ω	0Ω	■2.7KΩ	■2.7KΩ	0Ω		
V 4	6CB6	110KΩ	47Ω	.1Ω	0Ω	■470Ω	■470Ω	0Ω		
V 5	6CB6	.4Ω	150Ω	.1Ω	0Ω	■940Ω	■940Ω	0Ω		
V 6	6AL5	.4Ω	1Meg	1.4Ω	0Ω	0Ω	0Ω	5.6KΩ		
V 7	6AH6	5.6KΩ	0Ω	.1Ω	0Ω	†3.9KΩ	†68KΩ	560Ω		
V 8	6AU6	■16KΩ	■2.7KΩ	.1Ω	0Ω	320KΩ	■0Ω	■2.7KΩ		
V 9	6AU6	1.5Ω	0Ω	.1Ω	0Ω	■1KΩ	■1KΩ	150Ω		
V 10	6AU6	100KΩ	0Ω.	.1Ω	0Ω	■1KΩ	■1KΩ	150Ω		
V 11	6T8	Inf.	12KΩ	Inf.	0Ω	.1Ω	1Meg	0Ω	10Meg	■330KΩ
V 12	6C4	■47KΩ	47KΩ	0Ω	.1Ω	■47KΩ	375KΩ	50KΩ		
V 13	6AQ5	■330KΩ	■180Ω	¶0Ω	¶.1Ω	†940Ω	†720Ω	■330KΩ		
V 14	6AQ5	■330KΩ	■180Ω	¶0Ω	¶.1Ω	†940Ω	†720Ω	■330KΩ		
V 15	12AT7	■12KΩ	23KΩ	0Ω	.1Ω	.1Ω	23KΩ	1Meg	0Ω	0Ω
V 16	6SN7GT	570KΩ	#780KΩ	820Ω	40KΩ	†100KΩ	820Ω	.1Ω	0Ω	
V 17	6V6GT	0Ω	.1Ω	#8.1KΩ	#8.1KΩ	2.2Meg	4.3KΩ	0Ω	1.3KΩ	
V 18	6C4	50KΩ	Inf.	0Ω	.1Ω	50KΩ	200KΩ	100KΩ		
V 19	12AU7	†83KΩ	715KΩ	1.2KΩ	.1Ω	.1Ω	#300KΩ	270KΩ	1.2KΩ	0Ω
V 20	6AU5GT	470KΩ	.1Ω	33Ω	Inf.	#48Ω	Inf.	0Ω	†9KΩ	
V 21	6W4GT	Inf.	Inf.	140KΩ	Inf.	†50Ω	Inf.	.1Ω	0Ω	
V 22	1B3GT	PINS 1 THROUGH 8 HAVE IN RESISTANCE								TOP CAP #550Ω
V 23	5U4G	Inf.	15KΩ	Inf.	24Ω	Inf.	25Ω	Inf.	15KΩ	
V 24	17BP4A	0Ω	470KΩ	PIN 10 #33KΩ	PIN 11 50KΩ	PIN 12 .1Ω				

ALL MEASUREMENTS TAKEN IN TV POSITION ONLY
ALL CONTROLS SET FOR NORMAL OPERATION
† MEASURED FROM PIN 2 OF V23
# MEASURED FROM PIN 3 OF V21
■ MEASURED FROM 110VDC LINE
¶ MEASURED FROM PIN 2 OF V 13



RF TUNER-RIGHT SIDE



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range.

Adjust the ringing coil, (B1), until the picture synchronizes horizontally.

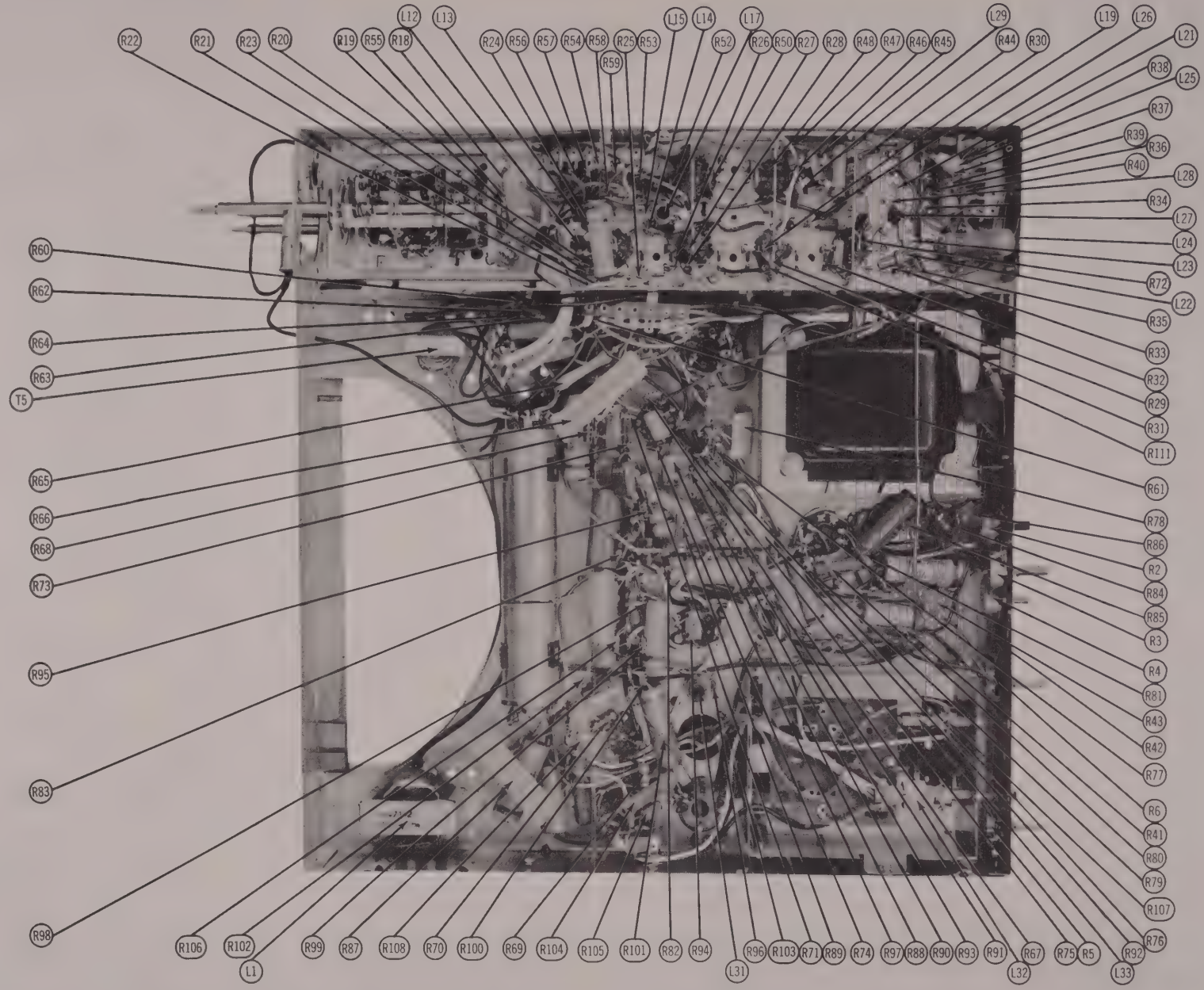
Adjust the width slug, (B2) until the picture is slightly wider than necessary to fill the mask horizontally.

Adjust the horizontal linearity slug, (B3), until the picture is symmetrical from left to right.

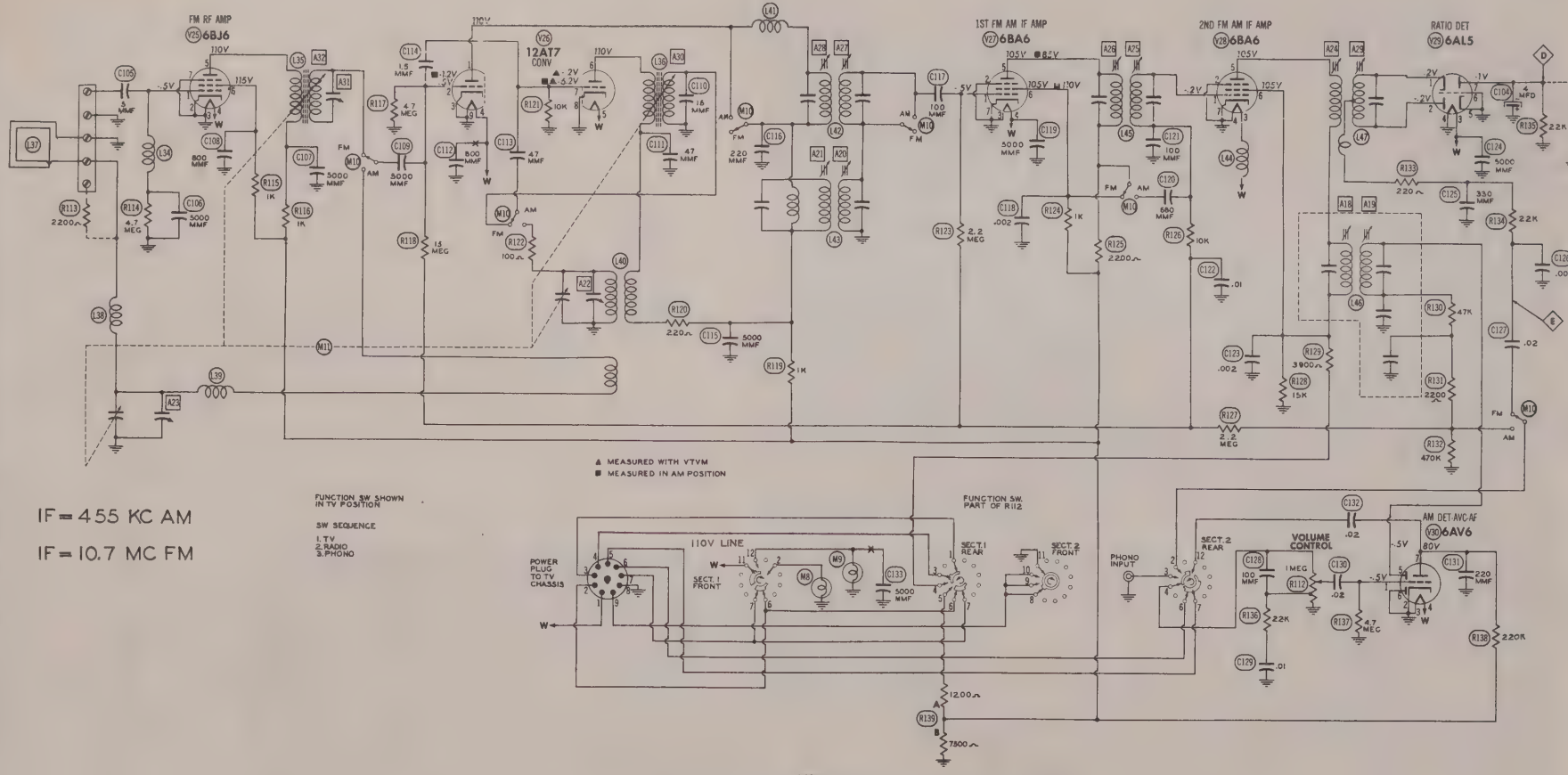
DISASSEMBLY INSTRUCTIONS

1. Remove 7 control knobs from front panel.
2. Disconnect and remove tone control from inside upper cabinet wall.
3. Disconnect built-in antenna.
4. Disconnect and remove speaker.
5. Remove 4 chassis bolts. Remove chassis.

Note. For picture tube removal it is necessary to remove chassis as outlined above.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 25	6BJ6	4.7Meg	0Ω	0Ω	.1Ω	†2.2KΩ	†2.2KΩ	0Ω		
V 26	12AT7	†2.2KΩ	3.5Meg	0Ω	.1Ω	.1Ω	†2.2KΩ	10KΩ	0Ω	0Ω
V 27	6BA6	4.8Meg	0Ω	0Ω	.1Ω	†1.8KΩ ▲†3.4KΩ	†1.8KΩ ▲†2.1KΩ	0Ω		
V 28	6BA6	2.6Meg	0Ω	.7Ω	0Ω	†3.4KΩ	†3.4KΩ	0Ω		
V 29	6AL5	INF	INF	.1Ω	0Ω	0Ω	0Ω	22KΩ		
V 30	6AV6	4.7Meg	0Ω	0Ω	.1Ω	530KΩ	0Ω	†220KΩ		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS NOTED
● MEASURED IN "AM" POSITION
▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED 110 VDC LINE

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1952

WESTINGHOUSE MODELS H-660C17, H-661C17
(Ch. V-2203-1 and Radio Ch. V-2180-3)

RADIO SCHEMATIC

TV PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		WESTINGHOUSE PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	6AK5	6AK5	7BD	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Det. Noise Clipper	6AL5	6AL5	6BT	
V7	Video Amp.	6AH6	6AH6	7BK	
V8	Keyed AGC	6AU6	6AU6	7BK	
V9	1st Sound IF Amp.	6AU6	6AU6	7BK	
V10	2nd Sound IF Amp.	6AU6	6AU6	7BK	
V11	Ratio Det. Audio Amp.-AGC Clamper	6T8	6T8	9E	
V12	Audio Phase Inv.	6C4	6C4	6BG	
V13	Audio Output	6AQ5	6AQ5	7BZ	
V14	Audio Output	6AQ5	6AQ5	7BZ	
V15	Sync. Amp.-Sync. Seperator	12AT7	12AT7	9A	
V16	Vert. Mult.	6SN7GT	6SN7GT	8BD	
V17	Vert. Output	6V6GT	6V6GT	7AC	
V18	Horiz. Phase Det.	6C4	6C4	6BG	
V19	Horiz. Mult.	12AV7	12AV7	9A	
V20	Horiz. Output	6AU5GT	6AU5GT	6CK	
V21	Damper	6W4GT	6W4GT	4CG	
V22	H.V. Rect.	1B3	1B3	3C	
V23	L.V. Rect.	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA			RTMA BASE TYPE	NOTES
	WESTINGHOUSE PART No.	SYLVANIA PART No.	THOMAS PART No.		
V24	17BP4A	17BP4A		12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	450	V-9891	AFH4-93		UPT4445-3335		TVL-4720	▲Filter
B	40	450							■ Filter
C	30	350							▲Decoupling
D	30	350							Audio Output Cathode
C2A	30	450	V-10306-1	AFH3-158		UPT4145-V10		TVL-3753	▲ Vert. Output Dec.
B	10	450		PRS50/100					■ Audio Output Screen
C	150	50							▲Vert. Output Cathode
C3	10	250	V-10117	PRS250/12		BR1225A		TVA-1504	Video Amp. Screen
C4	10	450	V-10293-1	PRS450/10		BR1045A		TVA-1705	Vert. MV Decoupling
C5	4	50	V-4637	PRS150/4		BR550		TVA-1303	Stabilizing Cap.
C6	15			SI15	D6-150		GP1K-150	5GA-Q15	RF Coupling
C7	1500			BPD-0015	DD-152		801-0015	5HK-D15	AGC Filter
C8	470			SI470	D6-471		GP2K-471	5GA-T47	RF Amp. Plate Dec.
C9	1500			BPD-0015	DD-152		801-0015	5HK-D15	RF Amp. Screen Bypass
C10	1500			BPD-0015	DD-152		801-0015	5HK-D15	RF Amp. Fil. Bypass
C11	3.9						NP0K-3R9		RF Coupling
C12	.68				TCZ-.68		NP0K-R68		RF Coupling
C13	.75						NP0K-R75		RF Coupling
C14	25			SI25	D6-250		GP1K-250		RF Coupling
C15	.68				TCZ-.68		NP0K-R68		Osc. Coupling
C16	1.5						N330K-1R5		Osc. Feedback
C17	10			SI10NP0	TCZ-10		NP0K-100		Osc. Grid Cap.
C18	.5				TCZ-.5		NP0K-R50		Fixed Trimmer
C19	1500			BPD-0015	DD-152		801-0015	5HK-D15	Conv. Fil.
C20	15			SI15	D6-150		GP1K-150	5GA-Q15	Fixed Trimmer
C21	5000		V-5596	BPD-005	DD-502		811-005	5HK-D5	RF Bypass
C22	240	500		1469-00025		5R5T25			Fixed Trimmer
C23	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Bypass
C24	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	5HK-D5	IF Coupling
C25	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		4TM-P1	AGC Filter
C26	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		4TM-P1	AGC Filter
C27	800		V-9863-1	BPD-0008	DD-801	1W5T8	801-001		AGC Filter
C28	12		R3CC20SL120K	SI12	D6-120		GP1K-120		Fixed Trimmer
C29	1.5		V-9926-1	SI1.5NP0	TCZ-1.5		NP0K-1R5		IF Coupling
C30	800		V-9863-1	BPD-0008	DD-801	1W5T8	801-001	5HK-D1	1st Video IF Dec.
C31	800		V-9863-1	BPD-0008	DD-801	1W5T8	801-001	5HK-D1	AGC Filter
C32	1		V-5658-1		TCZ-1		NP0K-010		IF Coupling
C33	12		R3CC20SL120K	SI12	D6-120		GP1K-120		Fixed Trimmer
C34	800		V-9863-1	BPD-0008	DD-801	1W5T8	801-001	5HK-D1	2nd Video IF Dec.
C35	800		V-9863-1	BPD-0008	DD-801	1W5T8	801-001	5HK-D1	2nd Video IF Fil.
C36	800		V-9863-1	BPD-0008	DD-801	1W5T8	801-001	5HK-D1	3rd Video IF Dec.
C37	800		V-9863-1	BPD-0008	DD-801	1W5T8	801-001	5HK-D1	3rd Video IF Fil.
C38	800		V-9863-1	BPD-0008	DD-801	1W5T8	801-001	5HK-D1	Video Det. Fil.
C39	56	500	V-9926-1						Fixed Trimmer
C40	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		4TM-P1	Video Coupling
C41	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Bypass
C42	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Bypass
C43	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Picture Tube Fil.
C44	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Keyed AGC Cathode
C45	.05	400	RCP10W4503M	P488-05	DF-503	PTE4S5		4TM-S5	AGC Filter
C46	.25	400	RCP10W4254M	P488-25		GT4P25		4TM-P25	AGC Filter
C47	4.7		V-9926-3	SI4.7NP0	TCZ-4.7		NP0K-4R7		Sound IF Coupling
C48	47	500	RCM20B470K	1469-00005	TCZ-47	5R5Q5	NP0K-470	MS-45	Fixed Trimmer
C49	.002	600	RCP10W6202M	P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	1st Sound IF Dec.
C50	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	5HK-D5	1st Sound IF Cathode
C51	47	500	RCM20B470K	1469-00005	TCZ-47	5R5Q5	NP0K-470	MS-45	Fixed Trimmer
C52	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Bypass
C53	47	500	RCM20B470K	1468-00005	D6-470	5W5Q5	GP1K-470	1FM-45	Sound IF Coupling
C54	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	5HK-D5	2nd Sound IF Dec.
C55	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	5HK-D5	2nd Sound IF Cathode
C56	470		R5CC20ZY471K	SI470	D6-471	5W5T5	GP2K-471	5GA-T47	RF Bypass
C57	.001	400	RCP10W2102M	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	De-emphasis

TV PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C58	.02	400	RCP10W4203M	P488-02	DF-203	PTE4S1	GP2-333-103	4TM-S2	Audio Coupling
C59	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Tone Comp.
C60	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C61	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	5HK-D5	AGC Filter
C62	150	500	RCM20B151M	1468-00015	D6-150	5W5T15	GP2K-150	1FM-315	AF Amp. Plate
C63	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C64	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Tone Comp.
C65	.05	400	RCP10W4503M	P488-05	DF-503	PTE4S5		4TM-S5	Audio Coupling
C66	.05	400	RCP10W4503M	P488-05	DF-503	PTE4S5		4TM-S5	Audio Coupling
C67	.002	600	RCP10W6202M	P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Audio Output Plate
C68	33	500	RCM20B330K	1468-00025	D6-330	5W5Q35	GP1K-330	MS-425	Voltage Divider
C69	.35	400	RCP10W4354M	P488-35		GT4P35		4TM-P35	Sync. Coupling
C70	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Sync. Coupling
C71	270	500	RCM20B271K	1468-0003	D6-270	5W5T3	GP2K-271	MS-33	Sync. Coupling
C72	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Sync. Amp. Fil.
C73A	.002			P688-002		PTE6D2	GP2-333-202		Vert. Integrator Net.
B	.005		•V-9313	P688-005	•PC-100	PTE6D5	GP2-333-502	•101C1	Vert. Integrator Net.
C	.005			P688-005		PTE6D5	GP2-333-502		Vert. Integrator Net.
C74	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Vert. MV Feedback
C75	.05	400	RCP10W4503M	P488-05	DF-503	PTE4S5		4TM-S5	Vert. MV Cathode
C76	.1	600	RCP10M6104M	P688-1	DF-104	PTE6P1		6TM-P1	Vert. Sweep Coupling
C77	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		4TM-P1	Vert. Sweep Coupling
C78	.1	600	RCP10M6104M	P688-1	DF-104	PTE6P1		6TM-P1	Vert. Sweep Coupling
C79	100	500	RCM20B101K	1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	Horiz. Sync. Coupling
C80	.001	600	RCP10W6102M	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Voltage Divider
C81	330	500	RCM20B331K	1468-00035					Horiz. Feedback
C82	470	500	RCM20B471K	1469-0005		5R5T5		MS-35	Voltage Divider
C83	.005	600	RCP10W4502M	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	AFC Coupling
C84	.05	400	RCP10W4503M	P488-05	DF-503	PTE4S5		4TM-S5	AFC Filter
C85	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Horiz. MV Grid
C86	120	500	RCM20C121J	1469-00015		5R5T15			Horiz. MV Feedback
C87	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		4TM-P1	Horiz. Hold Bypass
C88	47	500	RCM20B470K	1469-00005		5R5Q5		MS-45	Horiz. MV Plate
C89	3900	500	RCM30C392K	1464-004		1DR5D4			Fixed Trimmer
C90	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		4TM-P1	Voltage Divider
C91	.1	600	RCP10M6104M	P688-1	DF-104	PTE6P1		6TM-P1	RF Bypass
C92	820	500	RCM20C821K						Horiz. Discharge
C93	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Horiz. Sweep Coupling
C94	.1	600	RCP10M6104M	P688-1	DF-104	PTE6P1		6TM-P1	Horiz. Output Screen
C95	.1	400	RCP10W4104M	P488-1	DF-104	PTE4P1		4TM-P1	Horiz. Output Cathode
C96	.06	600	RCP10M6603M	P688-06		PTE6S6		6TM-S6	Damper Filter
C97	.06	600	RCP10M6603M	P688-06		PTE6S6		6TM-S6	Damper Filter
C98	500	20000	V-9901-2	HV-20C	TV3-502				HV Filter
C99	.25	600	RCP10W4254M	684-25		GP6P25		6TM-P25	Horiz. Sweep Coupling
C100	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Bypass
C101	.01	600	V-5040-15	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Line Filter
C102	.01	600	V-5040-15	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Line Filter
C103	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Bypass •

* Not Used In All Models
• Items C73A, C73B, C73C, R77A, R77B, R77C are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	Westinghouse PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1	1500Ω		V-9877			SBBT-565-S	Contrast Control
	500KΩ						Volume Control & Switch
R2A	5000Ω		V-6463	QU-114	AG-19-S	AN-10	Vertical Linearity Control
B	Shaft		Not Req.	Not Req.	RS-2	AK-4	Attach to R2A per instructions
R3A	500KΩ	½	V-9894-1	QU-133	AG-58-S	AN-59	Vertical Hold Control
B	Shaft		Not Req.	Not req.	FKS-1/4	AK-1	Attach to R3A per instructions
R4A	250KΩ	½	QU-130		AG-55-S	AN-50	Height Control #
B	Shaft		Not Req.	Not Req.	RS-2	AK-1	Attach to R4A per instructions
R5A	125KΩ	½	V-10509-1		AG-49-S	B-40	Horizontal Hold Control
B	Shaft		Not Req.		FS-3	Not Req.	Attach to R5A per instructions
R6A	50KΩ	½	V-9916-1	QU-123	AG-44-S	AN-31	Brightness Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R6A per instructions
R7A	1Meg	½	V-10130-3	QU-137	AG-63-Z	B-70	Tone Control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R7A per instructions

500KΩ Height Control Part No. V-9813-3 Used in Some Models

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	Westinghouse PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE SPECIFIED
R8	15KΩ	20% ½		BTS-15k	RF Amplifier Grid
R9	1000Ω	20% ½		BTS-1000	RF Amplifier Screen
R10	7500Ω	20% ½		BTS-8200	RF Amplifier Decoupling
R11	4700Ω	½		BTS-4700	Mixer Grid
R12	220KΩ	20% ½		BTS-220K	Mixer Grid
R13	111Ω	20% ½		BTS-120	Mixer Coil Shunt
R14	4700Ω	½		BTS-4700	Mixer Coil Shunt
R15	470Ω	½		BTS-470	Mixer Plate Decoupling
R16	4700Ω	½		BTS-4700	Oscillator Plate
R17	15KΩ	20% ½		BTS-15K	Oscillator Grid
R18	150Ω	½	RC20AE151K	BTS-150	Decoupling
R19	1Meg	½	RC20AE105K	BTS-1Meg	AGC Network
R20	220KΩ	½	RC20AE224K	BTS-220K	AGC Network
R21	100KΩ	½	RC20AE104K	BTS-100K	AGC Network
R22	10KΩ	20% ½	RC20AE103M	BTS-10K	AGC Network
R23	10KΩ	20% ½	RC20AE103M	BTS-10K	1st. Video IF Grid
R24	47Ω	½	RC20AE470K		1st. Video IF Cathode
R25	2700Ω	5% ½	RC20AE272K	BTS-2700-5%	1st. Video IF Decoupling
R26	4700Ω	½	RC20AE472K	BTS-4700	Video IF Coil Shunt
R27	47Ω	½	RC20AE470K		2nd. Video IF Cathode
R28	470Ω	½	RC20AE471K	BTS-470	Decoupling
R29	3000Ω	5% ½	RC20AE302K		Video IF Coil Shunt
R30	150Ω	½	RC20AE151K	BTS-150	3rd. Video IF Cathode
R31	470Ω	½	RC20AE471K	BTS-470	3rd. Video IF Decoupling
R32	8200Ω	5% ½	RC20AE822K	BTS-8200-5%	3rd. Video IF Coil Shunt
R33	22KΩ	20% ½	RC20AE223M	BTS-22K	Peaking Coil Shunt
R34	18KΩ	½	RC20AE183K	BTS-18K	Isolation
R35	5600Ω	20% ½	RC20AE562M	BTS-5600	Video Output Grid
R36	68KΩ	½	RC30AE683K	BTA-68K	Video Output Screen
R37	33KΩ	½	RC20AE333K	BTS-33K	Peaking Coil Shunt

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	Westinghouse PART No.	IRC PART No.	IDENTIFICATION CODES
R38	3900Ω	2	RC40AE392K	BTB-3900	Video Output Plate
R39	100KΩ	½	RC20AE104K	BTS-100K	Voltage Divider
R40	100KΩ	½	RC20AE104K	BTS-100K	Picture Tube Cathode
R41	470KΩ	½	RC30AE474K	BTS-470K	Picture Tube Grid.
R42	12KΩ	½	RC20AE123K	BTS-12K	Voltage Divider
R43	68KΩ	½	RC20AE683K	BTS-68K	Voltage Divider
R44	150Ω	½	RC20AE151K	BTS-150	1st. Sound IF Cathode
R45	1000Ω	20% ½	RC20AE102M	BTS-1000	1st. Sound IF Decoupling
R46	100KΩ	½	RC20AE104K	BTS-100K	2nd. Sound IF Grid
R47	150Ω	½	RC20AE151K	BTS-150	2nd. Sound IF Cathode
R48	1000Ω	20% ½	RC20AE102M	BTS-1000	2nd. Sound IF Decoupling
R49	27KΩ	½	RC20AE273K	BTS-27K	De-emphasis
R50	12KΩ	½	RC20AE123K	BTS-12K	Ratio Detector Diode Load
R51	10KΩ	20% ½	RC20AE103M	BTS-10K	Tone Compensation
R52	10Meg	20% ½	RC20AE106M	BTS-10Meg	Audio Amplifier Grid
R53	330KΩ	½	RC30AE334K	BTS-330K	Audio Amplifier Plate
R54	560Ω	½	RC20AE561K	BTS-560	AGC Network
R55	4.7Meg	20% ½	RC20AE475M	BTS-4.7Meg	AGC Network
R56	330KΩ	½	RC30AE334K	BTS-330K	Audio Phase Inverter Grid
R57	330KΩ	½	RC20AE332K	BTS-3300	Audio Phase Inverter Cathode
R58	47KΩ	½	RC20AE473K	BTS-47K	Audio Phase Inverter Cathode
R59	47KΩ	½	RC20AE473K	BTS-47K	Audio Phase Inverter Plate
R60	150Ω	20% ½	RC20AE151M		Parasitic Suppressor
R61	150Ω	20% ½	RC20AE151M		Parasitic Suppressor
R62	330KΩ	½	RC20AE334K	BTS-330K	Audio Output Grid
R63	330KΩ	½	RC20AE334K	BTS-330K	Audio Output Grid
R64	180Ω	1	RC30AE181K	BTA-180	Audio Output Cathode
R65	680Ω	5	V-6984-2	1 3/4A-700	Audio Output Decoupling
R66	8000Ω	10	V-9800-8	1 3/4A-8000	Voltage Divider
R67	470KΩ	½	RC20AE474K	BTS-470K	Sync. Amplifier Grid
R68	5200Ω	5% ½			AGC Grid
R69	10KΩ	2	RC40AE103K	BTB-10K	AGC Cathode
R70	3300Ω	1	RC30AE332K	BTA-3300	Bleeder
R71	12KΩ	½	RC20AE123K	BTS-12K	Sync. Amplifier Plate
R72	1Meg	20% ½	RC20AE105M	BTS-1Meg	Sync. Clipper Diode Load
R73	470KΩ	½	RC20AE474K	BTS-470K	Sync. Peaking
R74	1Meg	½	RC20AE105K	BTS-1Meg	Sync. Seperator Grid
R75	150KΩ	½	RC20AE154K	BTS-150K	Sync. Seperator Plate
R76	22KΩ	½	RC20AE223K	BTS-22K	Sync. Seperator Plate
R77	1800Ω	½	RC20AE182K	BTS-1800	Voltage Divider
R78A	22KΩ	½		BTS-22K	Integrator Network
B	8200Ω	½	V-9213 •	BTS-8200	Integrator Network
C	8200Ω	½		BTS-8200	Integrator Network
R79	100KΩ	1	RC30AE104K	BTA-100K	Vertical MV Plate
R80	820Ω	½	RC20AE821K	BTS-820	Vertical MV Cathode
R81	270KΩ	½	RC20AE274K	BTS-270K	Vertical MV Grid See Note 1
R82	470KΩ	½	RC20AE474K	BTS-470K	Vertical MV Plate See Note 1
R83	100KΩ	½	RC20AE104K	BTS-100K	Vertical MV Plate Decoupling
R84	4300Ω	5% ½	RC20AE432J		Vertical Integrator
R85	2.2Meg	½	RC20AE225K	BTS-2.2Meg	Vertical Output Grid
R86	470Ω	½	RC20AE471K	BTS-470	Vertical Output Cathode
R87	7500Ω	10	V-9600-3	1 3/4A-7500	Vertical Output Decoupling
R88	100KΩ	½	RC20AE104K	BTS-100K	Horizontal Phase Detector Grid
R89	100KΩ	½	RC20AE104K	BTS-100K	Horizontal Phase Detector Cathode
R90	47KΩ	½	RC20AE473K	BTS-47K	Horizontal Phase Detector Plate
R91	220KΩ	½	RC20AE224K	BTS-220K	Horiz. Feedback
R92	470KΩ	½	RC20AE474K	BTS-470K	Horizontal AFC Filter
R93	47KΩ	½	RC20AE473K	BTS-47K	Horizontal AFC Filter
R94	1200Ω	½	RC20AE122K	BTS-1200	Horizontal MV Cathode
R95	27KΩ	½	RC20AE273K	BTS-27K	Horizontal MV Plate
R96	22KΩ	½	RC20AE223K	BTS-22K	Ringing Coil Shunt
R97	56KΩ	1	RC30AE563K	BTA-56K	Horizontal MV Decoupling
R98	240KΩ	5% ½	RC20AE244J		Horizontal MV Grid
R99	270KΩ	½	RC20AE274K	BTS-270K	Horizontal MV Plate
R100	12KΩ	½	RC20AE123K	BTS-12KΩ	Horizontal Peaking
R101	150Ω	½	RC20AE151K		Parasitic Suppressor
R102	470KΩ	½	RC20AE474K	BTS-470K	Horizontal Output Grid
R103	33Ω	1	RC30AE330K		Horizontal Output Cathode
R104	12KΩ	10	V-9600-11	1 3/4A-12K	Horizontal Output Screen
R105	56KΩ	1	RC30AE563K	BTA-56K	Horizontal Output Screen See note 2.
R106	33KΩ	½	RC20AE333K	BTS-33K	Decoupling
R107	5600Ω	½	RC20AE562K	BTS-5600	Linearity Coil Shunt
R108	3300Ω	½	RC20AE332K	BTS-3300	AGC Network See note 3.
R109	330KΩ	1	RC30AE334K		HV Filter
R110	330KΩ	1	RC30AE334K		HV Filter
R111	220KΩ	20% 1	RC30AE224M	BTA-220K	Line Isolation

• Items C73A, C73B, C73C, R77A, R77B and R77C are combined in one unit.
Note 1. When alternate height control is used R80 becomes 470KΩ and R81 is not used.
Note 2. Not used in all models.
Note 3. Some models may use a 2200Ω resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	Westinghouse PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ 1.8A	620VCT .220ADC	5VAC @ 3.0A	12.6VCT @ 5.5A SEC. 4 6.3VAC @ .9A	V-9958-3		P-3066	

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	Westinghouse PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	550Ω tapped @ 29Ω	13Ω tapped @ .45Ω & 8.7Ω SEC. 2 0Ω	V-10214-1	A-8130	HVO-6		Horiz. Output Trans.
T3	650Ω	12.5Ω	V-6981-2	A-8112 ①	A-3036 ①	TS0-5	Vert. Output Trans.
T4A	13Ω		V-10049-6	DY-8	MDF-70		Horiz. Deflection Coils
B	45Ω						Vert. Deflection Coils

① Drill One New Mounting Hole

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	Westinghouse PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T5	7.4KΩ CT	3.4Ω	440Ω CT	.9Ω	V-9983		A-2938①	RO-304①	① Drill One New Mounting Hole

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	Westinghouse PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	PM	3.4Ω	V-9770-1	10J12	10A4A	
	CONE DIA.	V. C. DIA.				
SP2	9 3/8"	1"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	Westinghouse PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.220A	40Ω	1.4Henries	V-6471-2	C-2326①	C-2991①	TR-3300 ①	① Drill One New Mounting Hole

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	Westinghouse PART No.	MERIT PART No.	IRC PART No.	NOTES
L2	Ant. Trans.	.1Ω	.1Ω				
L3	Ant. Coils	0Ω					
L4	Ant. Coil	0Ω		V-9881-2			Channel 13
L5	RF Coil	0Ω					
L6	Mixer Grid	0Ω					
L7	Osc. Coil	0Ω					Channel 13
L8	Osc. Coil	0Ω					Channel 6
L9	Fil. Choke	0Ω					
L10	Fil. Choke	0Ω					
L11	Conv. Plate	.1Ω					
L12	Ist. Video IF	0Ω		V-9881-2			
L13	41.25MC						
	Sound Trap	0Ω		V-10586-1			
L14	Fil. Choke	0Ω		V-4886-2			
L15	Fil. Choke	0Ω		V-4886-2			
L16	2nd. Video IF	.5Ω	.4Ω	V-9879			
L17	47.25MC Adj.						
	Sound Trap	0Ω		V-10771-1			
L18	3rd. Video IF	.5Ω	.4Ω	V-9879			
L19	Fil. Choke	2.6Ω		V-9099-4		CL-1	3.9 Microhenries
L20	4th. Video IF	.5Ω	.4Ω	V-9880			
L21	Noise Limiter	.9Ω		V-4886-1			
L22	Peaking Coil	6.8Ω		V-9915-1			100 Microhenries
L23	Sync. Coup.	1.3Ω		V-4886-1			
L24	4.5MC Trap	1Ω		V-9883-3			
L25	Peaking Coil	5Ω		V-5902-1			140 Microhenries
L26	Peaking Coil	11Ω		V-5902-5			250 Microhenries
L27	Ist.Sound IF	1.6Ω		V-9882-2			
L28	Fil. Choke	0Ω		V-4886-2			
L29	2nd. Sound IF	1.6Ω		V-9882-2			
L30	Ratio Det. Trans.	3.9Ω	1.1Ω	V-9884			Tap at 1.4 Ω
L31	Horiz. Osc.	84Ω		V-6764			
L32	Width Coil	1Ω	95Ω	V-9902	MWC-1		
L33	Horiz. Lin.	20Ω		V-9960	MWC-1		
L48	Fil. Choke	2.2Ω		V-9099-5		CLA	2.7 Microhenries

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	Westinghouse PART No.	NOTES
M1	Bayonet	6-8	.15	Brown		Type No. 47
M2	Bayonet	6-8	.15	Brown		Type No. 47

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M3A	RF Tuner	V-10805	
B	RF Tuner	V-10750-1	Alternate
M4	Focus Magnet	V-10206-2	
M5	Ion Trap	V-9784-3	
A9	Trimmer	V-9876	1.6-18MMF
	Knob	V-10445-1	Channel Selector
	Knob	V-9940-1	TV Fine Tuning
	Knob	V-9939-3	Tone (Rear)
	Knob	V-9939-1	Contrast
	Knob	V-9939-2	Tone
	Knob	V-9938-1	TV Volume Off/On
	Knob	V-6146-16	Horiz. Hold

WESTINGHOUSE MODELS H-660C17, H-661C17
(Ch. V-2203-1 and Radio Ch. V-2180-3)

RADIO PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		WESTINGHOUSE PART No.	STANDARD REPLACEMENT		
V25	FM RF Amp.	6BJ6	6BJ6	7CM	
V26	Converter	12AT7	12AT7	9A	
V27	lst. FM AM IF Amp	6BA6	6BA6	7BK	
V28	2nd. FM AM IF Amp.	6BA6	6BA6	7BK	
V29	Ratio Detector	6AL5	6AL5	6BT	
V30	AM Det. AVC AF Amp.	6AV6	6AV6	7BK	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C104	4	50	V-4637	PRS150/4		BR550		TVA-1303	Stabilizing Cap.
C105	4.7		V-9926-3	SI4.7NP0	TCZ-4.7		NP0K-4R7		FM RF Coupling
C106	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	5HK-D5	FM RF Amp. Grid †
C107	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	5HK-D5	FM RF Amp. Plate
C108	800		V-9863-1	BPD-0008	DD-801	1W5T8	801-001	5HK-D1	FM RF Amp. Screen
C109	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Coupling †
C110	15						N470K-150		Fixed Trimmer
C111	47		V-10710-1				N220K-470		Fixed Trimmer
C112	800		V-9863-1	BPD-0008	DD-801	1W5T8	801-001	5HK-D1	Conv. Fil. *
C113	47		R2CC30RK470K				N220K-470		Osc. Grid Cap.
C114	1.5		V-5658-9	SI1.5NP0	TCZ-1.5		NP0K-1R5		Osc. Coupling
C115	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Mixer Plate Dec.
C116	220		V-10710-2	SI220	D6-221	5W5T25	GP2K-221	5GA-T22	Mixer Plate Dec.
C117	100		R4CC2144101M	SI100	D6-101	5W5T1	GP1K-101	5GA-T1	IF Coupling
C118	.002	600	RCP10W6202M	P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	lst IF Amp. Screen
C119	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	5HK-D5	lst IF Amp. Fil.
C120	680	500		1479-0007	D6-681	1W5T7	GP2K-681	IFM-37	AM IF Coupling ‡
C121	100		R4CC2144101M	SI100	D6-101	5W5T1	GP1K-101	5GA-T1	2nd. IF Amp. Grid
C122	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	AVC Filter
C123	.002	600	RCP10W6202M	P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	2nd IF Amp. Dec.
C124	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Ratio Det. Fil.
C125	330	500	RCM20A331M	1468-00035	D6-331		GP2K-331	1FM-335	RF Bypass
C126	.001	600	RCP10W6102M	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	De-emphasis
C127	.02	200	RCP10W2203M	P288-02	DF-203	PTE4S2		2TM-S2	Audio Coupling
C128	100		R4CC2144101M	SI100	D6-101	5W5T1	GP1K-101	5GA-T1	Tone Comp.
C129	.01	400	RCP10W4103M	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Tone Comp.
C130	.02	200	RCP10W2203M	P288-02	DF-203	PTE4S2		2TM-S2	Audio Coupling
C131	220		V-10710-2	SI220	D6-221	5W5T25	GP2K-221	5GA-T22	AF Amp. Plate
C132	.02	400	RCP10W4203M	P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C133	5000		V-5596	BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Bypass *

* Not used in all models.
† Some models use 800MMF in this application (Part No. V-9863-1).
‡ Some models use .01MFD in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	Westinghouse PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R112	1Meg	½	V-10267-1				Volume Control & Function Selector Switch

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES	
	RESISTANCE	WATTS	Westinghouse PART No.	IRC PART No.		
R113	2200Ω 20%	½	RC20AE222M	BTS-2200	Antenna Loading	See note 2
R114	4.7Meg 20%	½	RC20AE475M	BTS-4.7Meg	FM-RF Grid	
R115	1000Ω 20%	½	RC20AE102M	BTS-1000	FM-RF Screen	
R116	1000Ω 20%	½	RC20AE102M	BTS-1000	FM-RF Plate Decoupling	
R117	4.7Meg 20%	½	RC20AE475M	BTS-4.7Meg	FM Mixer Grid	
R118	15Meg 20%	½	RC20AE156M	BTS-15Meg	FM Mixer Grid	
R119	1000Ω 20%	½	RC20AE102M	BTS-1000	Decoupling	
R120	220Ω 20%	½	RC20AE221M	BTS-220	Oscillator Plate	
R121	10KΩ 20%	½	RC20AE103M	BTS-10K	Oscillator Grid	
R122	100Ω	½	RC20AE101K		Parasitic Suppressor	
R123	2.2Meg 20%	½	RC20AE225M	BTS-2.2Meg	lst IF Grid	
R124	1000Ω 20%	½	RC20AE102M	BTS-1000	lst IF Screen	
R125	2200Ω 20%	½	RC20AE222M	BTS-2200	lst IF Plate Decoupling	
R126	10KΩ 20%	½	RC20AE103M	BTS-10K	AVC Network	See note 4.
R127	2.2Meg 20%	½	RC20AE225M	BTS-2.2Meg	AVC Network	
R128	15KΩ	1	RC30AE153K	BTA-15K	Bleeder	
R129	3900Ω	2	RC40AE392K	BTB-3900	2nd IF Decoupling	
R130	47KΩ 20%	½	RC20AE473M	BTS-47K	Diode RF Filter	
R131	2200Ω 20%	½	RC20AE222M	BTS-2200	Diode RF Filter	
R132	470KΩ 20%	½	RC20AE474M	BTS-470K	Diode Load	
R133	220Ω 20%	½	RC20AE221M	BTS-220	Balancing	
R134	22KΩ 20%	½	RC20AE223M	BTS-22K	De-emphasis	
R135	22KΩ	½	RC20AE 223K	BTS-22K	Ratio Detector Load	
R136	22KΩ 20%	½	RC20AE223M	BTS-22K	Tone Compensation	
R137	4.7Meg 20%	½	RC20AE475M	BTS-4.7Meg	Audio Amplifier Grid	
R138	220KΩ 20%	½	RC20AE224M	BTS-220K	Audio Amplifier Plate	
R139A	1200Ω	6	V-10054-2	3/4A-1250	Voltage Divider	
B	7500Ω	3		3/4A-7500	Voltage Divider	

Note 2. Not used in all Models
Note 4. Some Models may use a 2.2Meg Resistor in this application

RADIO PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	WESTINGHOUSE PART No.	MERIT PART No.	IRC PART No.	
L34	FM Ant. Coil	0Ω		V-10644-1			
L35	FM RF Coil	0Ω	0Ω	V-10642-1			
L36	FM Osc.	0Ω	0Ω	V-10643-1			
L37	AM Loop Ant.						
L38	AM Ant. Coil	1.8Ω		V-6157-1			
L39	RF Choke	3Ω		V-9099-2		CLA	3.3 Microhenries
L40	AM Osc. Coil	3.8Ω	9Ω	V-10641-1			
L41	Parasitic Supp.	0Ω		V-4886-13			
L42	lst. FM IF	0Ω	0Ω	V-9688			
L43	lst. AM IF	4.6Ω	10.9Ω	V-10619			
L44	Fil. Choke	.85Ω		V-9099-1		CLA	1.2 Microhenries
L45	2nd. FM IF	1.6Ω	1.6Ω	V-9642			
L46	2nd. AM IF	15.3Ω	15.3Ω	V-10351-1			
L47	Ratio Det. Trans.	2.7Ω	.4Ω	V-9828			Tap at .5Ω

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA							REMARKS
	Westinghouse PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M6		AC-AG-J	A-AG	W26B	A66U	33	0-2 or S-2	

ASTATIC, SHYRE, AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

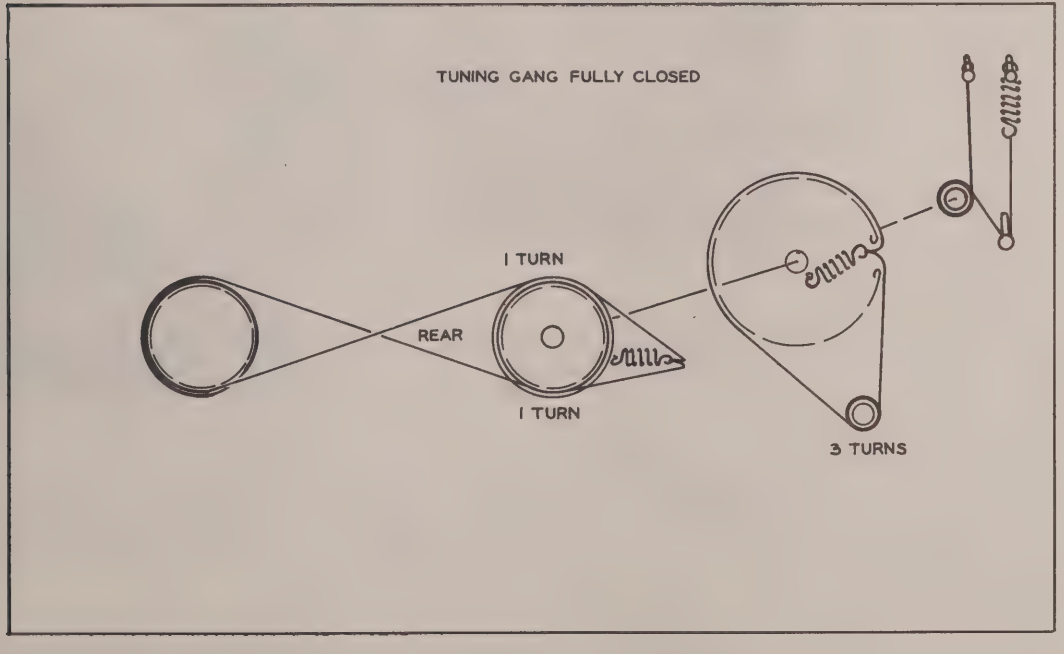
ITEM No.	REPLACEMENT DATA			REMARKS
	WESTINGHOUSE PART No.	WALCO PART No.	JENSEN PART No.	
M7		W-30AGA	JP-312	

DIAL LIGHTS

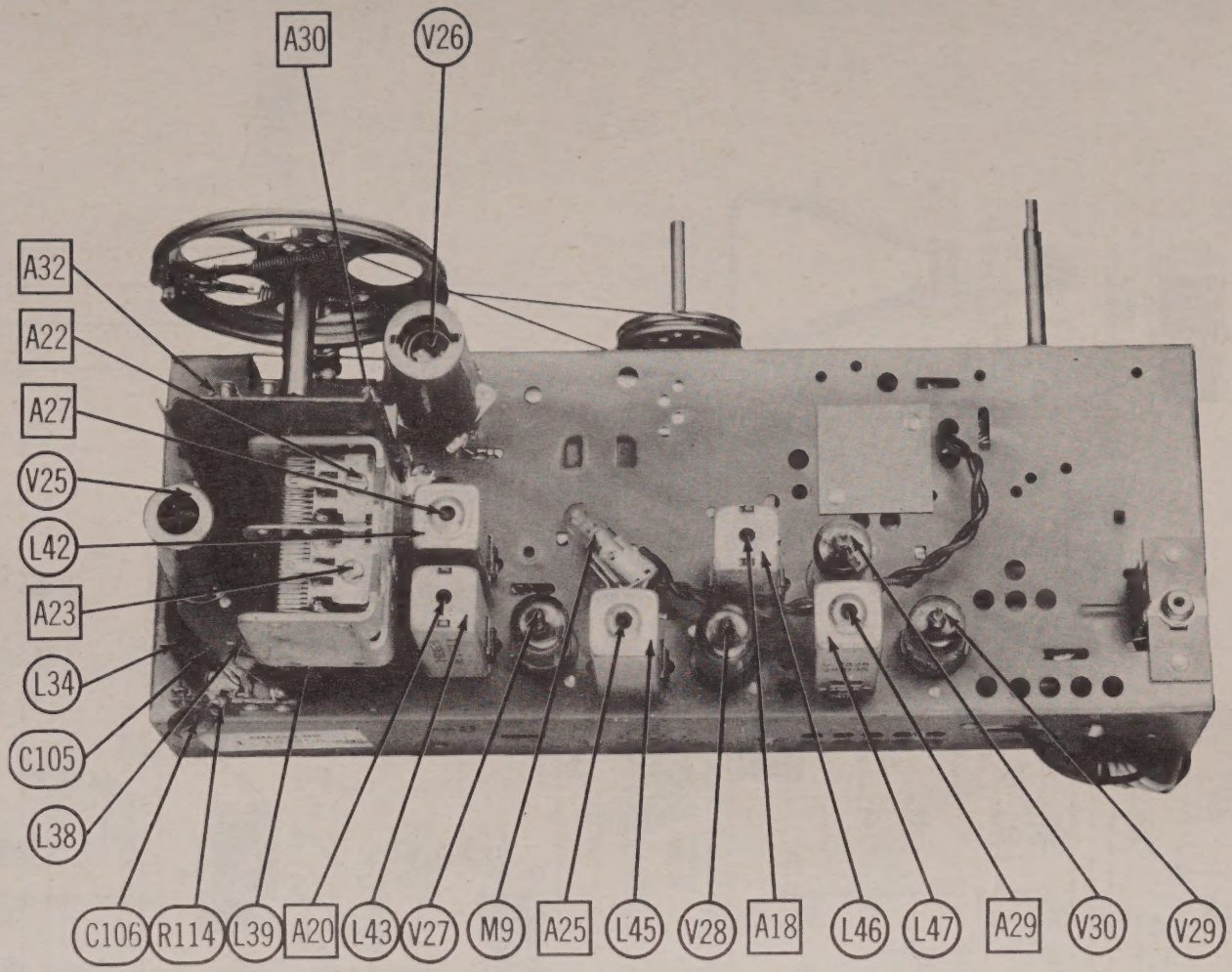
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					Westinghouse PART No.		
M8	Bayonet	6-8	.25	Blue			Type No. 44
M9	Bayonet	6-8	.25	Blue			Type No. 44

MISCELLANEOUS

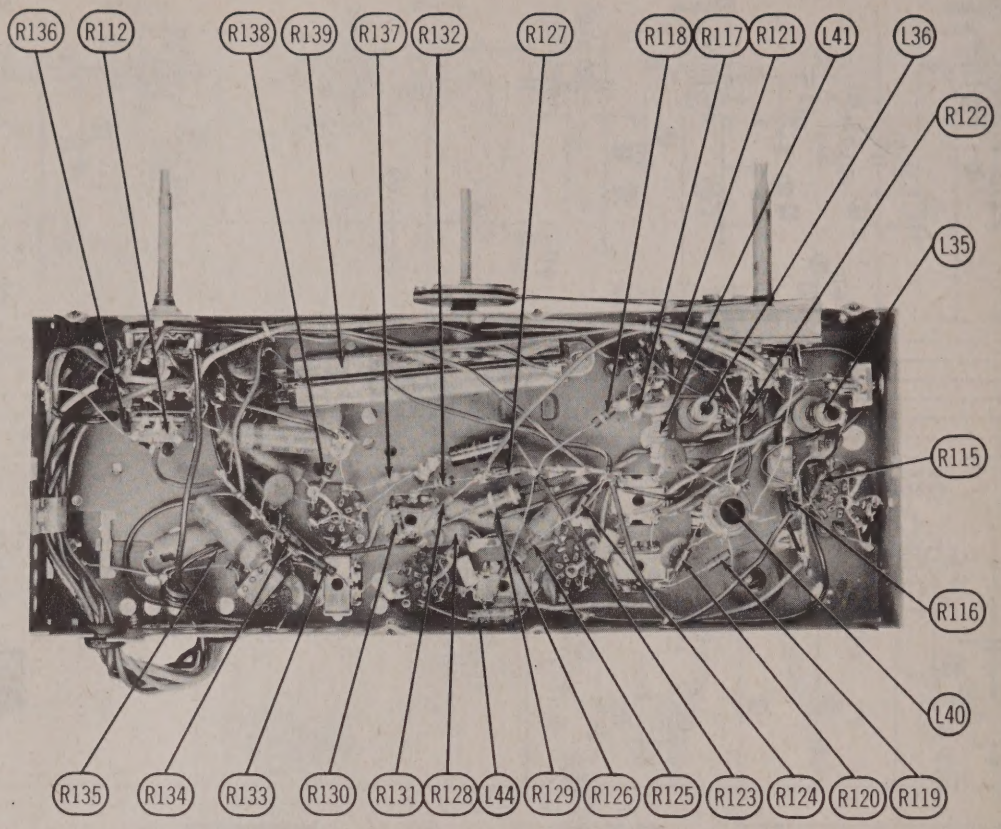
ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M10	Switch	V-10651-1	AM-FM
M11	Tuning Cap	V-10662-2	22-487MMF- 27-176MMF
	Knob	V-9104-9	Radio Tuning
	Knob	V-9861-3	TV-Radio-Phono Selector
	Knob	V-10408-1	AM-FM Band Selector
	Knob	V-10408-2	Radio Volume



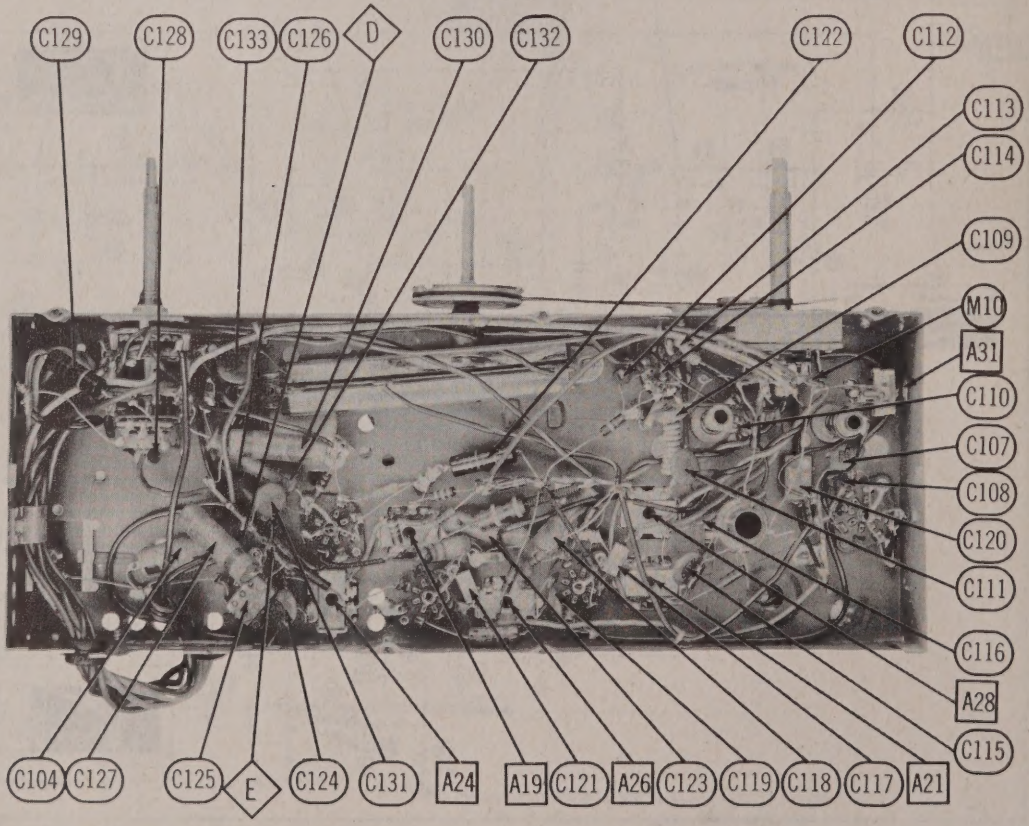
DIAL CORD STRINGING



RADIO CHASSIS-TOP VIEW



RADIO CHASSIS-BOTTOM VIEW-RESISTOR IDENTIFICATION



RADIO CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION